

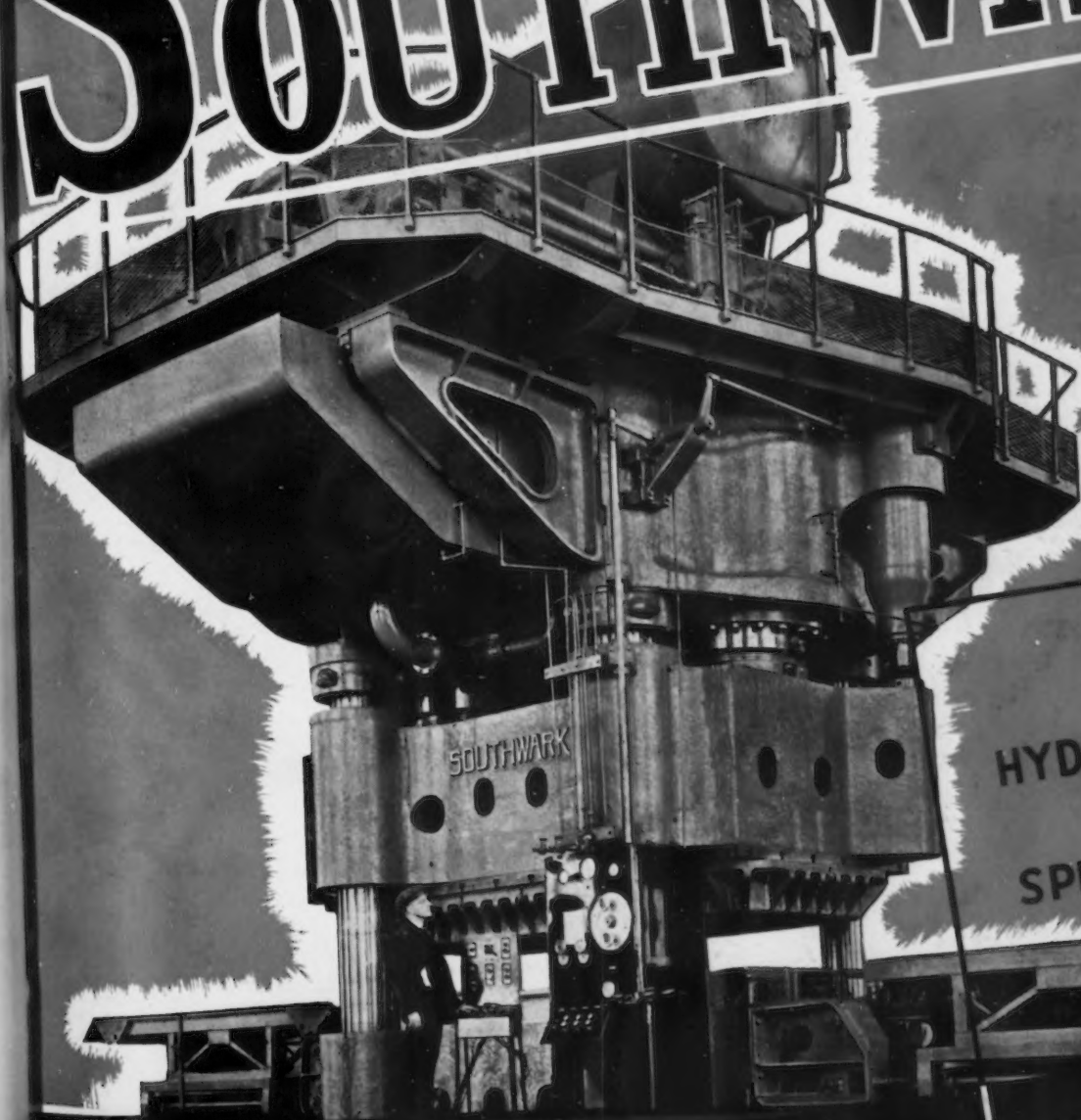
JULY 6, 1939

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# THE IRON AGE

# SOUTHWARK



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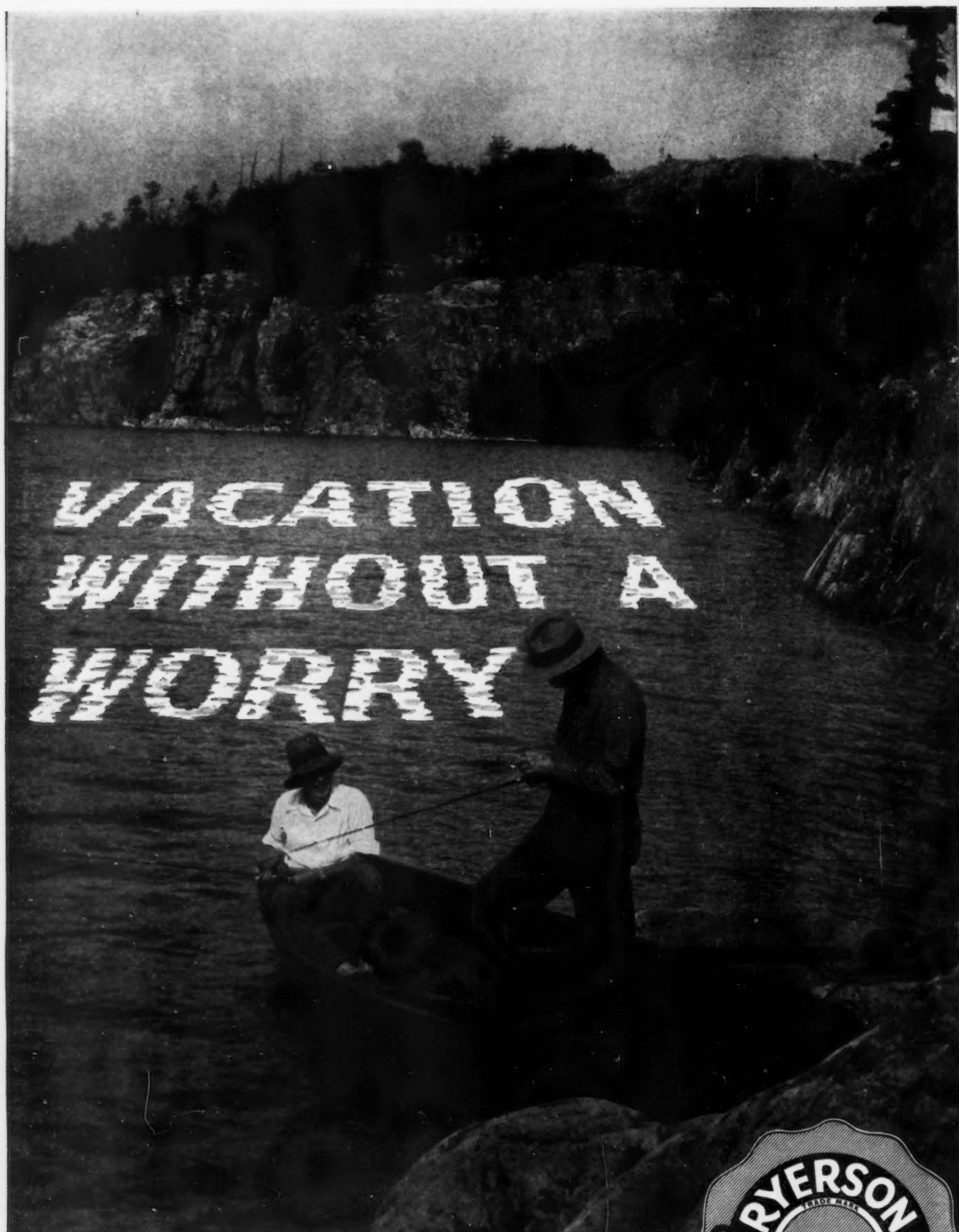
# THE IRON AGE

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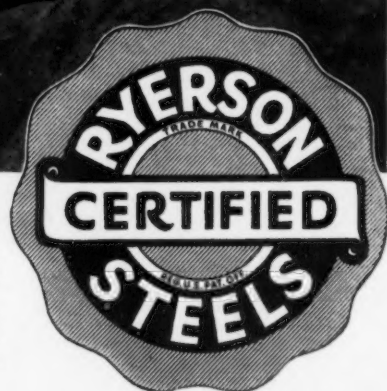
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JULY 6, 1939

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Vol. 144, No. 1

## Hot Weather Thoughts

SOME one has estimated that several million dollars worth of combustibles, including some structures accidentally set on fire, go up in smoke on the Fourth of July. This raises an interesting speculation as to the resulting economic balance. The products created by labor and purchased by peoples' surplus funds have been destroyed. So what? Is it a good thing or a bad thing?

One can argue on both sides of the question. If we did not permit people to spend their surplus funds for things to burn the linings of their coats and trousers, they might perhaps spend this extra cash for things that would burn the linings of their stomachs. And in either case, the people making these hazardous products have been provided with employment.

That, of course, is the philosophy back of "non-liquidating" made-work projects, such as leaf raking. Also it is the philosophy back of plowing under agricultural surpluses or killing off pigs, although the latter seem less excusable from the work creating angle.

In a measure this same thought also applies to such events as our World's Fairs, where much labor and thought are expended in erecting beautiful displays and impressive buildings destined to be torn down after one or two years of use. Of course, one could not say that such projects were altogether non-liquidating, for they coax money out of socks and into circulation. Also out of corporate surpluses, judging by the experience of some of the exhibitors.

Going up the scale to the extreme of non-liquidating economic activity, we might select war as the outstanding example. Here, most of the effort of an entire population may be devoted for a period of several years to making things that not only destroy but are destroyed themselves. And even a nation that may have very little in the way of financial reserve can apparently support this sort of business for extended periods.

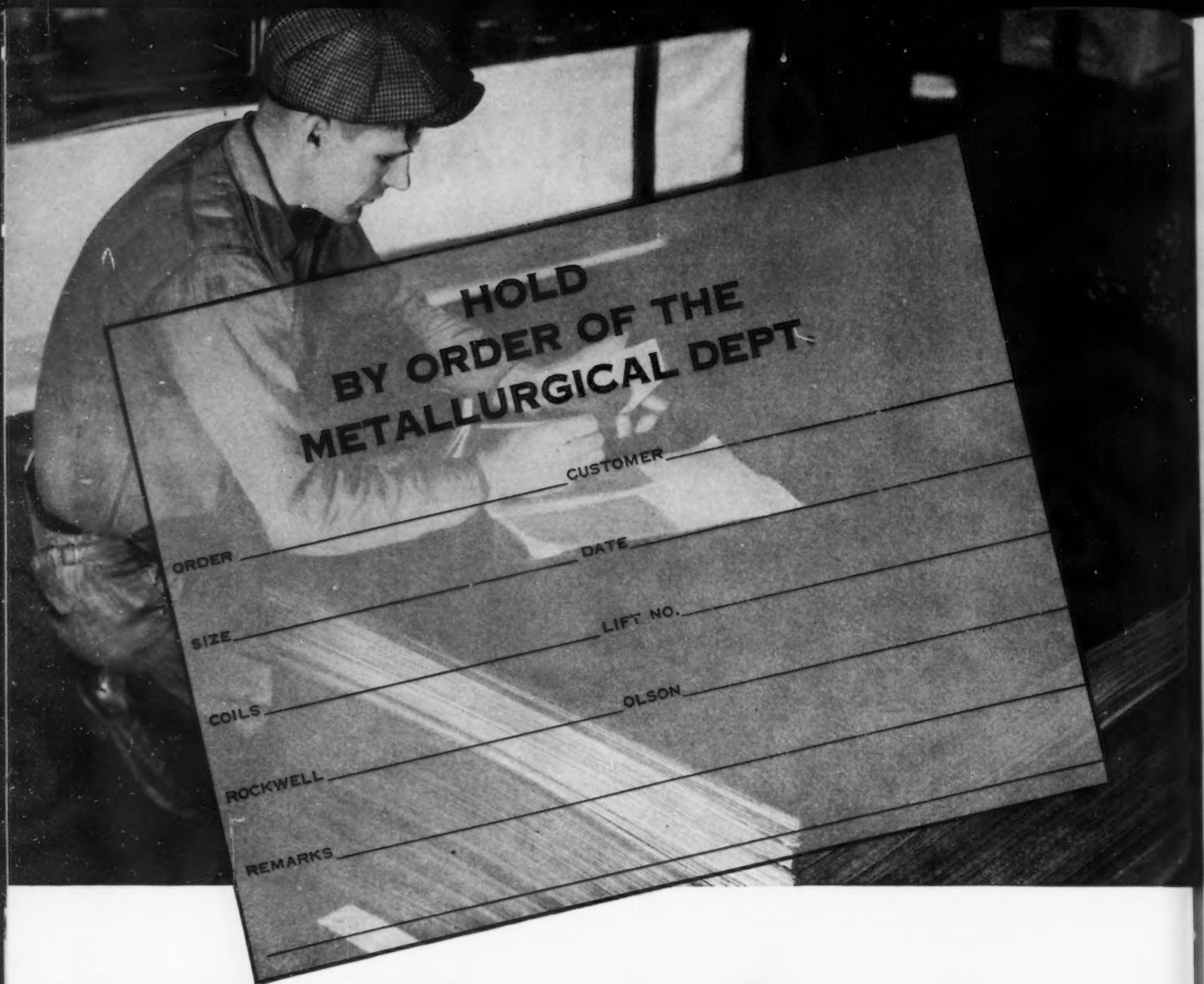
Perhaps it is this sort of evidence that has built the strange new philosophy that the way to prosperity is through profligacy.

Of course, the real answer is that our machine economy has created and stored up so much wealth that we can stand a little non-productive splurging at times, especially if it has a tonic effect on the customers. But we have to hold it within limits. The good old "self-liquidating" projects typified by "more goods for more people" through honest and earnest work are still the backbone of our economy and always will be.

If this were not true, we ought to make automobiles that would wear out in six months and build time bombs into all of our automatic refrigerators.

*John Van Dine*





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Walking through the various departments of Inland's modern flat rolled steel plant, you would see stacks of sheets here and there with green tickets attached.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

# COLD DRAWN STEEL

BY S. A. MOHT

• • •

AFTER 25 years of experience in the tool and die-making industry, both on the bench and in executive capacities, the writer several years ago went to work as a die maker in one of the steel mills specializing in tool, high speed and alloy steels. To leave an up-to-date job-shop with the finest of working equipment and to encounter the disorganization in the mill department was something of a shock. Much of the equipment was almost primitive, there was a total lack of working drawings or charts of any kind, and practically all work was performed by the cut-and-try method.

For example, perhaps the die maker had to produce a die to draw a hexagon bar to 0.500 plus or minus 0.002 and couldn't find a die. (And the writer means *find*, by looking on the floor, under the bench, or almost anywhere in the room.) Perhaps a die would be filed to about 0.010 in. under size, then sent to the hardening room for proper treatment, and on its return, it is polished out, then part of the bar is drawn for size. When the size is determined the necessary stock is re-

moved from the die to draw the size desired. 'Quite a system! And it is still being practiced today.

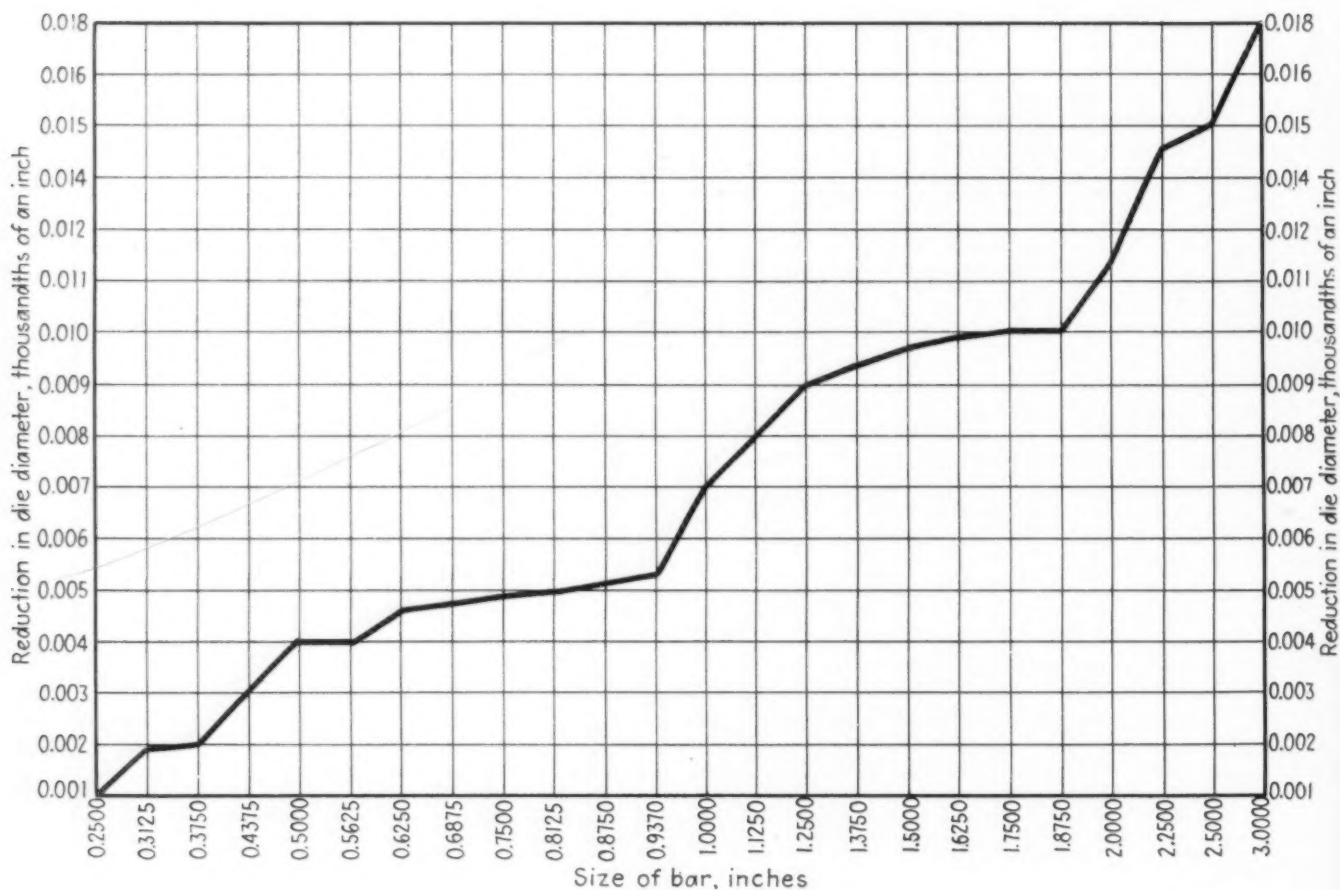
The writer found it difficult to stand such a system, a system which is unreliable, wasteful and involves an added risk of spoiling of a die by the die maker. While 30 years ago such a system may have been the height of efficiency, it hardly has a place in the craft today. Therefore, a system of some kind was undertaken whereby the die maker would know the size to make a die that would draw the type of steel under consideration to the size desired without any preliminary fussing around. Public libraries were searched for information without result, nor was anything available from the publishers that would be helpful. The result was that what looked like a moderate task actually extended over a period of three years, involving considerable clerical work and numerous experiments with dies of different designs.

The three-year research brought to light conditions in the sand-blast, pickling, and annealing departments that were unfortunate. One of the most important facts established was that the sand-blast, annealing, pickling and coating departments must work in harmony in order to produce results in the cold drawing department. No die maker living can produce a die that will stand up in production with bars half annealed showing a brinell hardness almost as hard as that of the die. Even Carboloy dies can't

stand the abuse of bars loaded with sand or sharp particles of shot from the sand blast which acts as anything but a lubricant on a die. Nothing will scratch or tear both die and bar quicker than improperly coated stock. Still another important factor is the choosing of a proper drawing lubricant.

After tying all such loose ends together into a workable whole, the results obtained were most gratifying. But, the gratifying results indicated perhaps that there is a serious lack of knowledge and information in this important art—and don't let it be said that the successful cold drawing of steels of this type isn't an art! In several cold drawing departments the author has seen, the departments have an overhead of thousands of dollars annually in wages, and use thousands of dollars worth of dies per year, but regardless of these facts, they were allowed to wallow around year after year like a ship with a broken rudder.

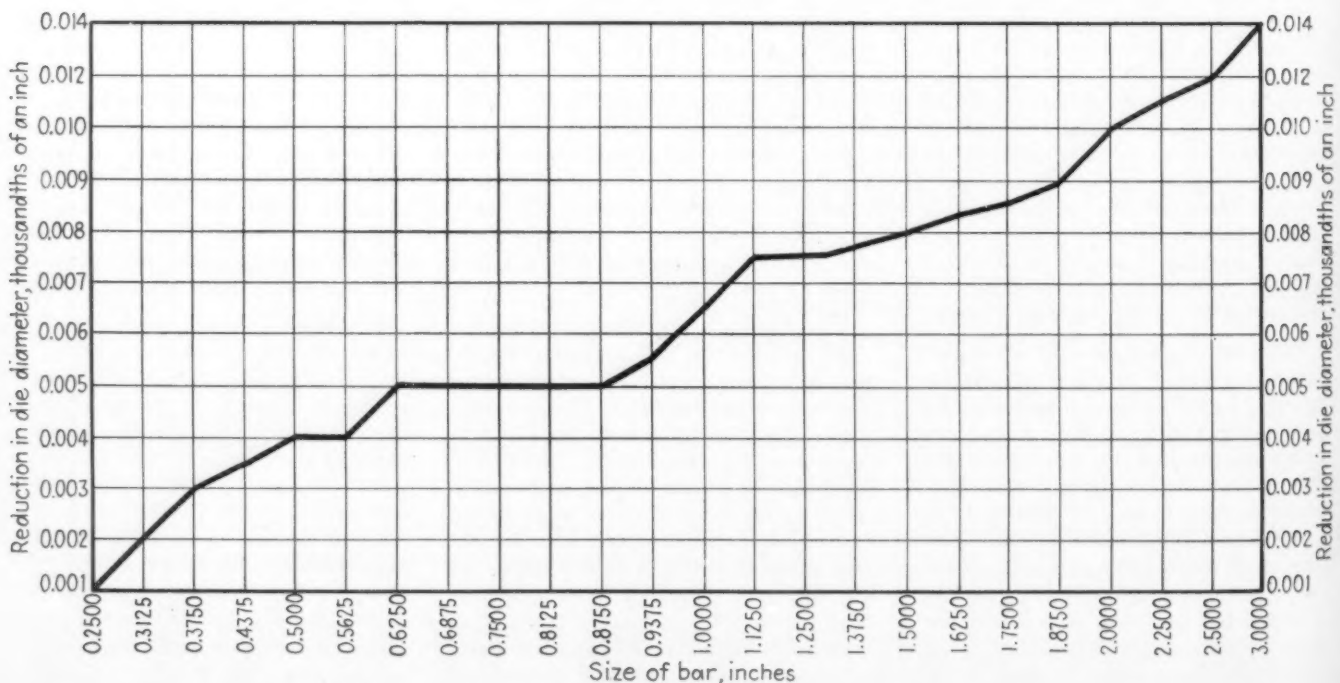
The large volumes of money mentioned are not estimates. The writer in the one shop already mentioned built 1152 dies in one year, but there was no reason on earth why 400 dies wouldn't have been more than ample—the 400 dies certainly would have taken care of production over that one-year period. The company maintained an engineering department and a mechanical laboratory from which all customers' inquiries concerning the characteristics and peculiarities of the various steels under given conditions



**FIG. 1**—Diameter correction for dies to draw 3.50 per cent nickel steel, heat treated, with brinell hardness of 262 to 302.

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**FIG. 2**—Diameter correction for dies to draw heat treated vanadium steel, having brinell hardness of 262 to 302.





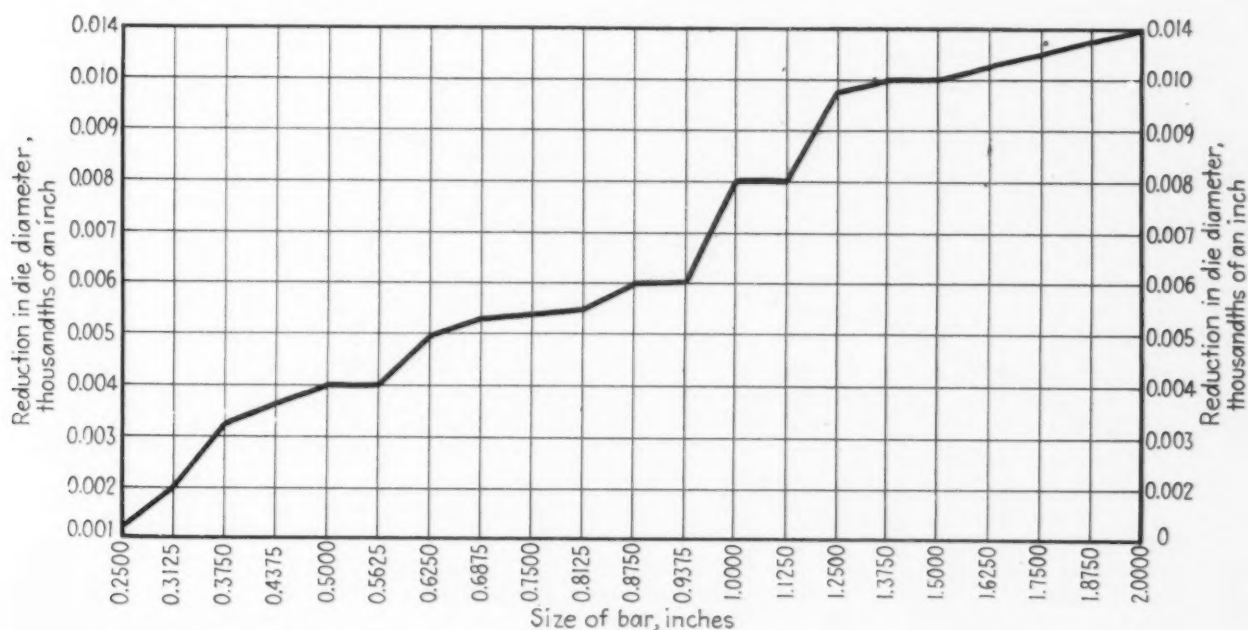
were answered. It was some lay-out! But, not one of the gentlemen in those departments, who so blandly offered advice and imparted information, could give data as to how many thousandths of an inch a bar of steel would swell in being cold drawn. This lack of data is no reflection on the ability of the engineers—rather, it is just another example of how neglect has handicapped this important branch of the steel making industry.

Perhaps one of these days certain steel makers will transfer some affection from fancy continuous mills to the cold drawing department, and institute some overhauling of modern

hardness, is not only costly but hardly in keeping with the advanced state of the steel industry in general. The entire responsibility is placed upon the die maker—he has to decide the type of die to use, the numbers and amount of each draft to reduce the steel to the practical size for finish drawing, always keeping the hardness range in mind. And in some cases, the die maker must even advise the rolling mill as to shape and size necessary for the first pass. Upon the die maker's judgment and ability to produce a satisfactory sample may rest an order running into thousands of dollars. Therefore would it not be

ment might appear both complicated and costly to install and maintain, actually such is not the case. All progressive manufacturers in the country base die cost on working drawings. That is the only way the cost of a product can be sensibly arrived at—it's a fundamental that can't be ignored. Any plant operating otherwise under present day competitive conditions is skating on thin ice.

Any engineer or die maker worthy of the title who is familiar with the characteristics of the steels being worked can adopt the six charts presented here to cover about any steel a plant will be called upon to cold



**FIG. 3—Diameter correction for dies to draw chrome - molybdenum heat treated bars, having hardness of 262/302 to 280/310.**

o o o

methods and equipment. The result might be some sweet profits even though perhaps prices were reduced.

The writer has seen specific jobs remelted as many as four times and completely processed four different times and still show a profit. This leads to a definite belief that by means of proper production methods far larger profits are possible, even larger profits if prices should undergo a resulting downward revision and consumer demands thereby increased. There is no steel that can be made and cold drawn, but what can be cold drawn to a desired finish and hardness, from charts regardless of shape of the bar.

The antiquated custom of bringing a job to the die bench with no specifications other than the size, desired shape, steel to be used and brinell

far more feasible to place the responsibility where it belongs, in the engineering department? The die maker could thus be left free to concentrate on turning out the most perfect die possible, which after all is his proper job.

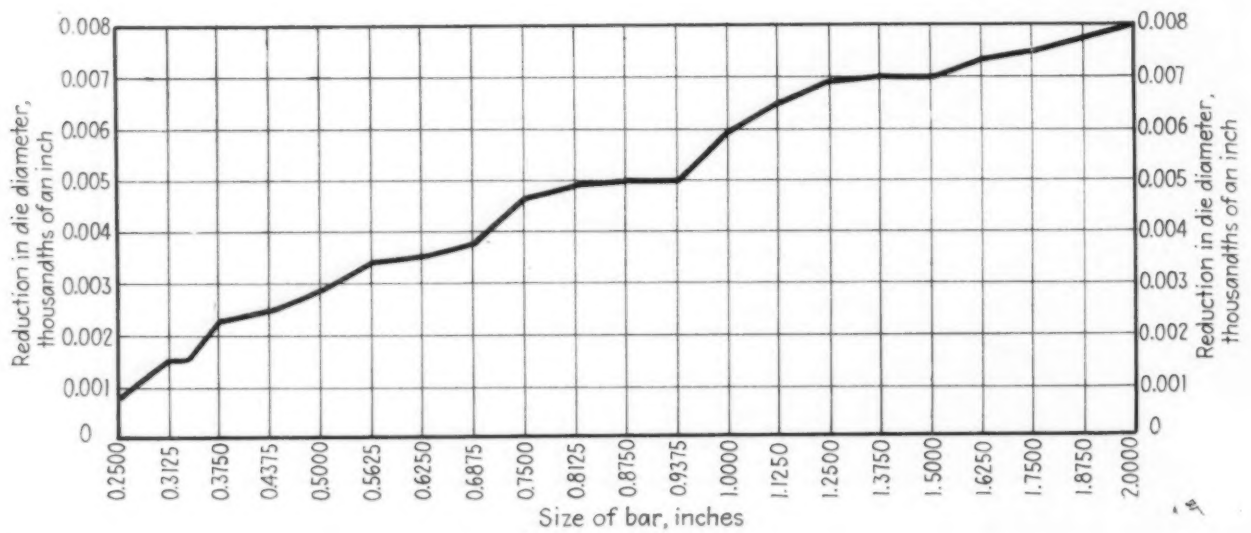
With some of the difficult shapes being cold drawn today the die maker has responsibility enough in the making of dies. While off-hand the system of using the engineering depart-

draw. The writer has used these charts in drawing over 30 different types and special mixes of steel through solid dies, drawing both standard and special shapes. And, when the bars were properly processed before cold drawing every bar produced was within the limits desired. Furthermore, using a properly designed die in conjunction with the charts, die room costs were quickly and materially reduced.

The department involved in the one mill operated 24 hr. a day, employing steadily six die makers on flats and shapes. Three of these were constantly on hexagon dies. This force was eventually reduced by the use of properly designed dies built to the chart measurements; (the accuracy of the charts made it possible to build dies far enough in advance to eliminate



**FIG. 4**—Diameter correction for dies to draw S.A.E. low-carbon steel, having a brinell hardness of 160 to 220.



**FIG. 5**—Diameter correction for dies to draw non-corroding steels having a brinell hardness of 180 to 241.



**FIG. 6**—Diameter correction for dies to draw non-corroding steels having a brinell hardness of 190 to 220.

any hold-up at the bar machines due to lack of dies), until finally one man was turning out all the hexagon dies necessary for three shifts. This reduction from three to one man was made in the face of constantly increasing production, and when peak production was reached, two die makers and one assistant handled all the die work. Die room cost was substantially reduced, as also was production cost. Where a single bar machine previously might draw a maximum of 200 bars of 0.750-in. stock in one shift, a point was reached where if a shift didn't draw 600 bars, someone certainly wanted to know why. Round bars ran even higher. Savings like these simply cannot be laughed off.

The information and charts presented in this article have been compiled from carefully kept records of the actual cold drawing of thousands of bars of steel. They offer an authentic picture of what has been accomplished. If the data are carefully applied, there is no reason why a lot of guess work and trouble cannot be eliminated. The type of dies, their design and construction, along with the different coatings and processing found most practical for the various grades of steel, will be discussed in a later article.

Probably the charts in Fig. 1, 2, and 3 proved the most valuable. These controlled the die sizes for drawing the heat-treated steels, that is, 3.5 per cent nickel, vanadium, and chrome-molybdenum. The charts proved their worth on more than one occasion, when trouble was experienced in holding bars to size and trying to eliminate twist in showing that the fault lay in the processing of the bars before they reached the drawing department and not in the dies. These steels were cold drawn to size after heat treatment, and were held within a brinell hardness range of from 214-262 to 262-302; and in some cases, especially with chrome-molybdenum to as high as 280-310. Chrome-molybdenum was by far the most difficult of the three steels to draw from the standpoint of both scratching and die wear.

A comparison of the three charts will readily show the sharp tendency of this steel to swell when cold drawing the larger sizes. The 3.5 per cent nickel was the most temperamental of the three—while it would stay within the desired size range, there was little assurance as to just what was going to happen to the die. The steel had a tendency to absorb an internal strain in heat treating that would develop into a decided twist in the bar

while drawing. This action in a die isn't conducive to long die life. Vanadium, contrary to expectations, proved an easy steel to handle, and it is by far the most consistent of the three. For downright cussedness nothing can equal the so-called non-corroding steels. The only redeeming feature they have is the fact that they are easy to hold to size. Any variation from the proper annealing and coating will make them practically impossible to draw.

Two charts for non-corroding steels are shown in Fig. 5 and 6. One chart controls the die size for a brinell hardness range from 180 to 241, the other, for a lower carbon content steel with a brinell hardness range of 190 to 220; the two are very nearly alike, and one die in most cases will draw either steel. Both are, however, necessary when drawing bars to 0.001-in. limit.

The remaining chart, Fig. 4, covers a wide variety of steels in the lower brinell hardness range, including all the S.A.E. steels.

The charts, Fig. 4, 5, and 6, will cover practically any steel that is not heat treated, including high speed steel when using a small draft. All these charts are based on a 0.025 to 0.30-in. draft. In the cold drawing of high speed steel it has been found more practical to use smaller drafts ranging from 0.008 to 0.015 in. in most cases, depending on the shape being drawn, in order to avoid strain checks.

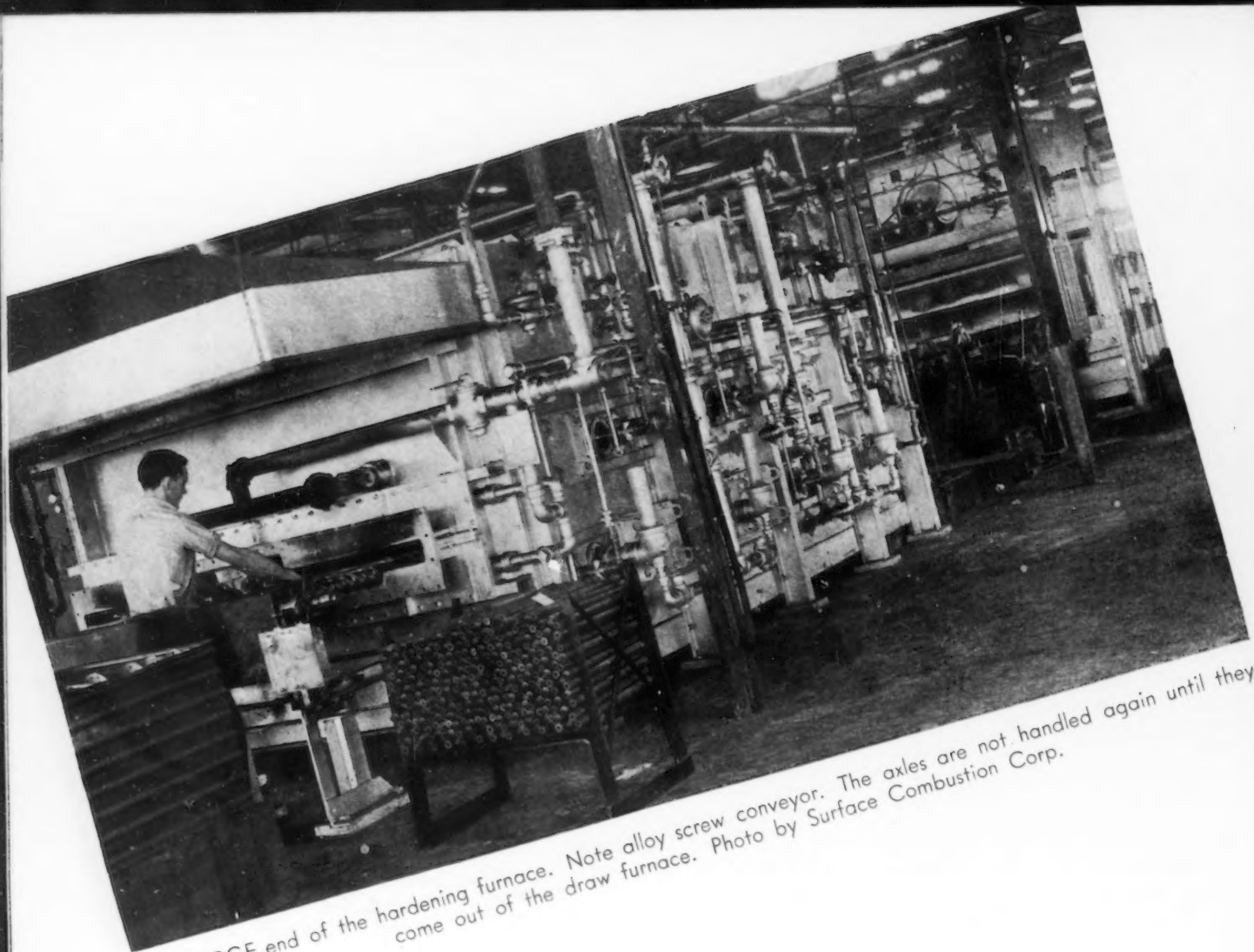
Charts shown in Fig. 1 and 2 have proved accurate in the drawing of high speed steel when using a heavier draft. On all the charts the right-hand column of figures designate the number of thousandths of an inch smaller the die should be made to draw a given size, while the horizontal figures indicate the various bar sizes. For example, if it is desired to draw a 3.5 per cent nickel heat treated bar to 0.5 in., the chart in Fig. 1 shows that it is necessary to have a die 0.004 in. smaller than the finish bar size, or 0.496 in. in diameter. When drawing S.A.E. steels after they have been heat treated, the chart in Fig. 2 should be used. For 3.5 per cent nickel, vanadium and chrome-molybdenum that hasn't been heat treated and is in the lower brinell hardness range, the charts in Fig. 5 and 6 may be used. By using a little discretion and basing a choice of charts on the brinell hardness of the steel to be drawn, their wide range will soon become apparent.

The importance of having the various steels properly processed before finish cold drawing has been constantly

stressed herein. From watching tons of steel roll merrily on their way back to the melt-floor by the scrap barrel route, the writer is convinced that there is no short cut in cold-drawing of steel. One high speed shape the writer's mill recently had, necessitated three break-downs with an anneal after each one before finish drawing. Handled this way, the job was fool-proof. Then some one acquired the inspiration of eliminating the anneal after the last break-down to save time, with the result that every bar was rejected for strain cracks from the finish draw. Two bar-machine operators were laid off for two weeks, but the responsible genius sailed merrily on. Another case was an S.A.E. type steel, heat treated. This was an 0.937-in. hexagon bar with a brinell hardness of 241 to 286, normally an easy job. The order called for hot-rolled steel, but due to an exceptionally poor surface it was necessary to cold draw for finish. To keep the cost as low as possible it was given just a water-lime coat (which in view of the poor surface condition was just asking for trouble) instead of the proper treatment. The first 18 bars ruined 20 dies, all of them new. After the job lay on the floor for three weeks, it was finally decided to handle it as should have been done originally. The result was that one die drew the remaining 275 bars and could have drawn 600 more if need be.

The two illustrations cited are not just the annoyances that crop up from time to time to demonstrate that a long distance must be travelled before attaining perfection, but in certain shops are common-place, every-day occurrences that go far in nullifying the expenditure of thousands of dollars for modern equipment in other departments. All too little attention has been paid to this final precision production of a product before it passes into the customers' hands. If it weren't for the natural pride every true die maker takes in turning out perfect work and the advice and counsel of some of the old-time steel makers in helping him reach that goal, the writer is convinced that there would be but little cold-drawn steel ever get past the inspection bench. Practically all worth while contributions made to the art have come from the die bench. Year after year, thousands of dollars are spent for new equipment in the various departments endeavoring to make them more efficient, but unfortunately the poor little cold-drawing orphan all too often in all too many mills continues to wear the same dress she has worn for the last 30 years.





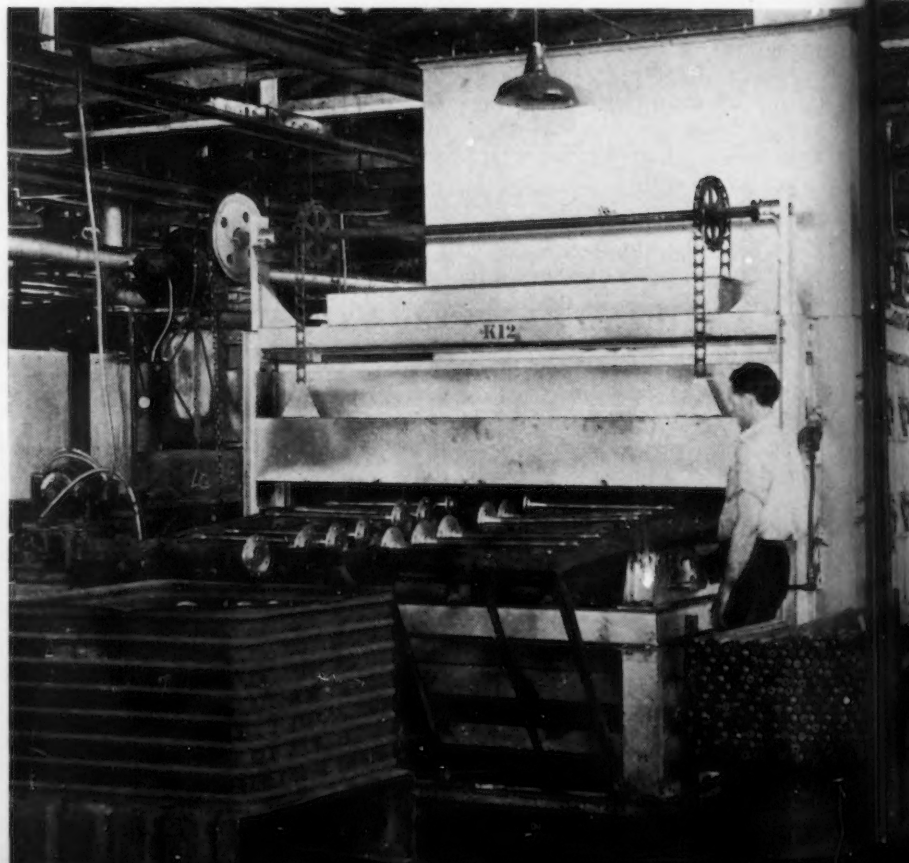
CHARGE end of the hardening furnace. Note alloy screw conveyor. The axles are not handled again until they come out of the draw furnace. Photo by Surface Combustion Corp.

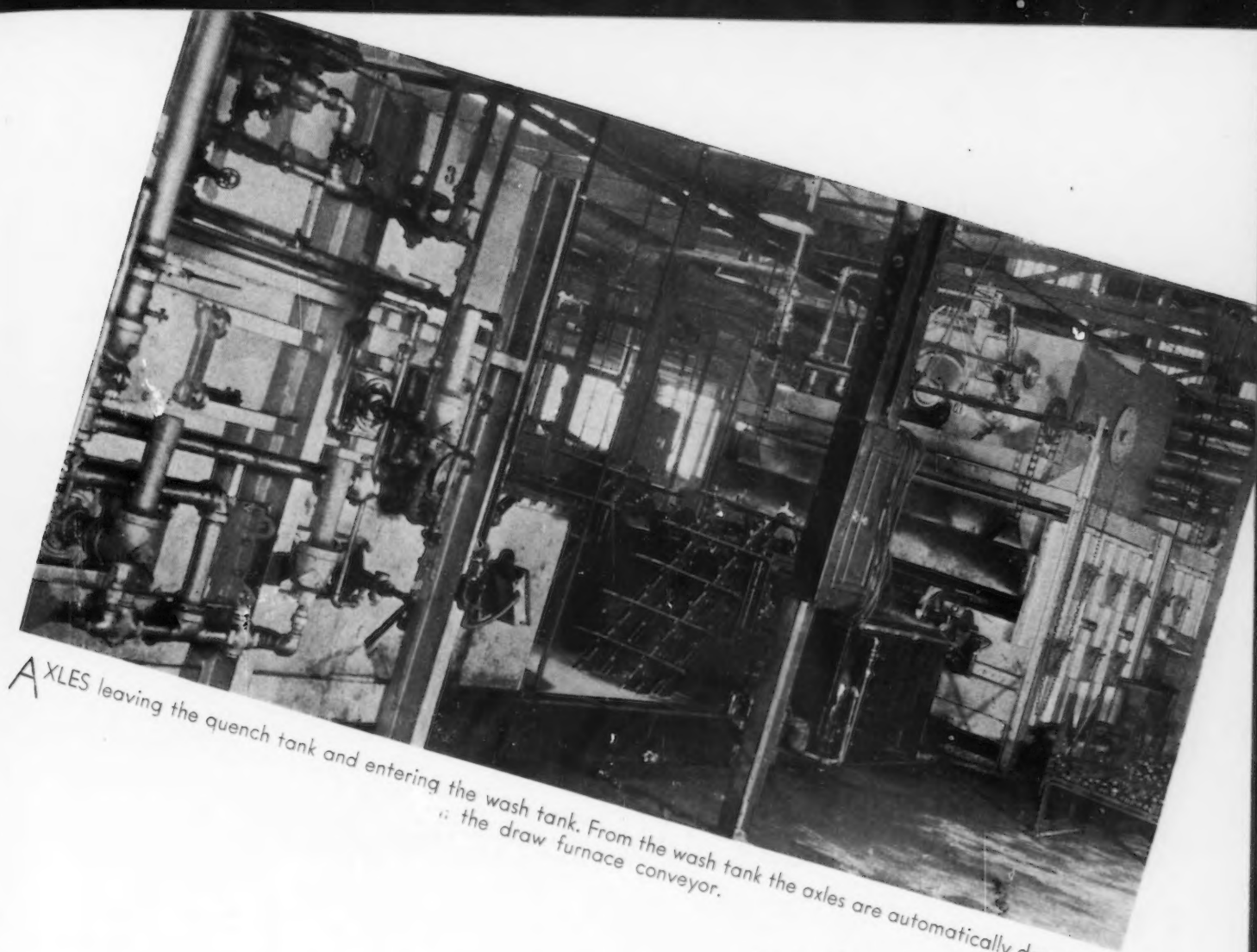
## HARDENING-DRAWING AXLES

THE rear axle shaft is subjected to sudden shock more than any other part of an automobile and is perhaps the one item which only recently received the considerable attention it deserves. However, plants all over the country have, in the last few years, directed much effort toward developing and perfecting new axle steels and methods of processing.

It is known that under certain conditions a hard, tough heat treated steel will do the job more efficiently than the same steel in the as-rolled or as-forged condition. It is also commonly known that a poor job of heat treating is worse than no heat treating at all. The surface of the axle must be of sufficient hardness to guarantee long wear and yet the shaft itself must be tough enough to absorb violent torsional impact and abnormal strain. This can be accomplished only by ap-

AXLES are shown here being discharged from the draw furnace. Photo by the





AXLES leaving the quench tank and entering the wash tank. From the wash tank the axles are automatically deposited on the draw furnace conveyor.

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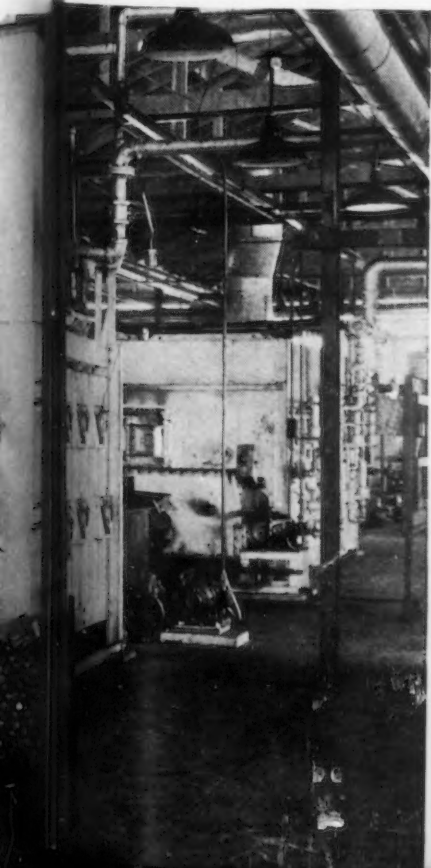
## AUTOMATICALLY

By L. C. POWELL

Chief Metallurgist, Warner Automotive  
Parts, Borg-Warner Corp.

• • •

photo by the Surface Combustion Corp.



plying the proper heat treatment to a selected high grade steel.

Recently the Warner Automotive Parts Division of the Borg-Warner Corp., manufacturer of replacement axles and other parts, was faced with the problem of installing equipment for hardening and drawing rear axles. The desire was to have equipment automatic in every respect, not only in constant heat maintenance but also in mechanical handling, to eliminate the human element and its variations in regard to all technical operations. The equipment also had to be universal to take care of more than one hundred different axles, ranging from large 8-in. flanged type truck shafts to smaller stock car types, to be mechanically handled in an automatic, continuous furnace.

Since all axles are machined before heat treating, it was imperative also to

have a controlled atmosphere furnace so as to eliminate both scale and decarburization.

The equipment, installed by Surface Combustion Corp., is a continuous unit in which the axles pass through the hardening furnace, then through the quench and wash, and finally through the draw furnace. The complete hardening and drawing cycle takes approximately 3½ hr. and the axles are never handled by the operator after once admitted to the hardening furnace.

The hardening furnace is heated by a number of gas-fired horizontal radiant tubes. Since the gas is burned entirely within these tubes, it is impossible for the products of combustion to come into contact with the work and cause scale or decarburization. However, atmosphere air, if it were allowed to enter the furnace, would

cause scaling and under certain conditions even decarburization.

To exclude air from the furnace, a non-oxidizing DX atmosphere is maintained within the furnace. This atmosphere is generated by a special unit which delivers a gas which is free of oxygen, dehydrated, of uniform composition and containing an abundance of carbon monoxide. Scaling and decarburizing are prevented, and as a result the axles reach the quench as clean and as free from surface defects as after machining.

Perhaps the most interesting and unique feature of the hardening furnace is the mechanical conveying system. This consists of two pairs (four screws) of centrifugally cast alloy heat-resisting screws. Two rows of axles are conveyed through the unit at the same time. The two pairs of conveyor screws are geared together

through a variable speed reducer and driven from a common shaft.

As the axles reach the discharge end of the hardening furnace, they fall a short distance by gravity onto a mechanically operated lowerator. The lowerator rapidly carries the shafts to a point above the level of the quenching medium, where they are deposited onto the quench chute support and roll for a short distance into the quenching oil and onto the quench tank conveyor. The quench tank conveyor carries the axles from the quench tank into and through the wash tank and automatically deposits them upon the draw furnace conveyor.

The draw furnace is of the recirculated air or convection type. Heating is accomplished by a single large air heater mounted on top of the furnace. Heat from this unit is carried to and

from the furnace (recirculated) by suitable duct work and a recirculating fan. Uniformity of heat input is controlled by graduated valve pins on both sides of the furnace. Heating in this furnace is exceptionally uniform. The maximum variation in hardness of the drawn axles is five points Rockwell.

The conveyor in the draw furnace consists of four steel chains which return beneath the furnace.

The complete over-all length of the hardening furnace, quench tanks, and draw furnace is approximately 60 ft. The unit has a capacity of 700 lb. per hr., equivalent to 1500 stock car axles per 24-hr. day. It is symbolic of modern heat treating practice and straight line production. Results are indicative to what great extent metallurgy has been incorporated in productive planning.

## Photometric Dust Determinations

**D**ETAILED study and use of a photometric method of determining the amount of dust in a suspension have been made by J. F. Cadden and E. T. Roetman, of the West Virginia State Department of Health. This method is said to be rapid (readings can be made in a few seconds), accurate, and consistent in its results.

The apparatus used is about one-fourth the size of a standard microscope box, and consists of a constant light source, a light-proof chamber for the container holding the suspension, a photoelectric cell (in the

light-proof chamber) and a meter outside. The suspension may be impinger collected samples, the washings from the electrostatic precipitator, or from other apparatus for collecting dust.

The constant light source is obtained by controlling the voltage of the current supplied to a tungsten filament lamp. The light is directed vertically through the suspension to the photoelectric cell. Readings show no variations due to settling of the dust.

There are numerous possible applications and some limitations of this

method, and it is expected that the apparatus will probably find its greatest usefulness as a control instrument for use by industrial establishments.

Calibrations must be made for each dust or type of dust in a plant using the equipment. In many plants only one or two calibrations are necessary. These calibrations can be made by any person familiar with dust counting, that is by plant engineers, industrial hygiene consultants, or industrial hygiene bureaus.

The accompanying table shows results with dust from a brick plant. First, a calibration curve for the dust from the brick plant was prepared by plotting instrument readings against the number of particles of dust per c.c. of suspension. The median size of the dust was 1.15 microns.

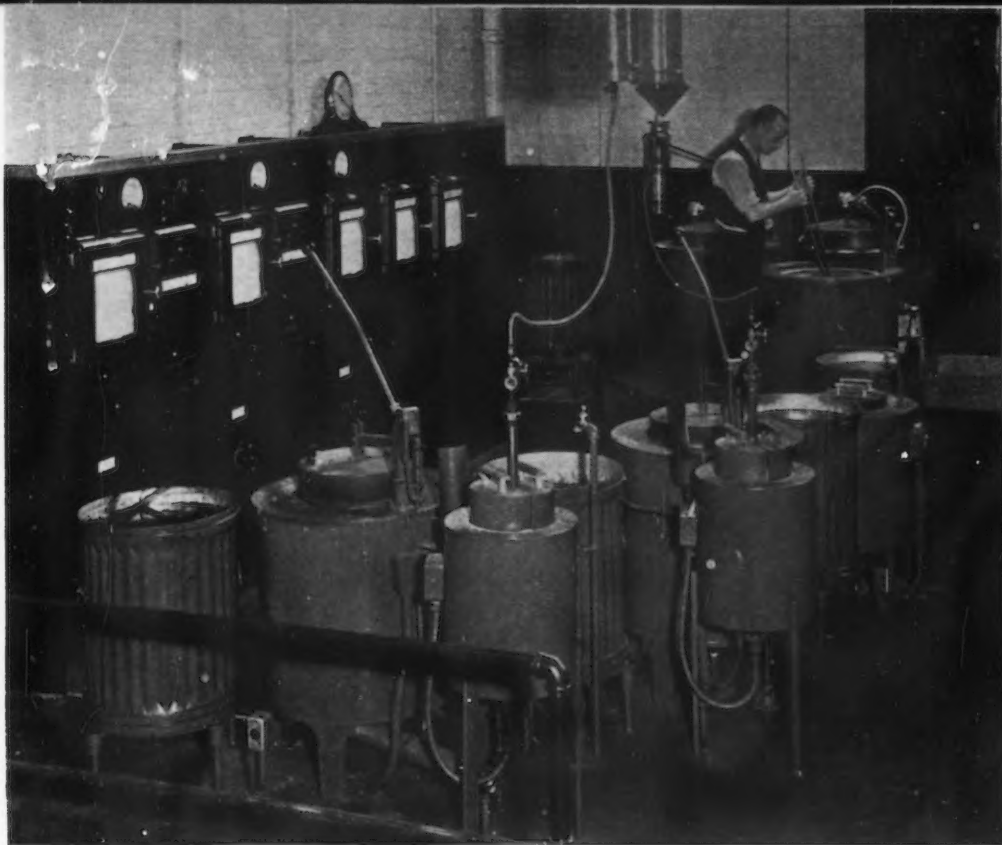
After the calibration curve was prepared impinger samples of dust were collected from an experimental dust chamber and at the brick plant from which the original dust was obtained.

The table shows the instrument readings for these samples, the number of particles per c.c. read from the curve, and the number of particles per c.c. obtained by counting, using the technique described in Public Health Bulletin No. 217. The high accuracy of this photometric method is demonstrated by these data.

Sample Number	Reading	A		A — B
		Number of Particles per c.c., Estimated from Calibration Curve	Number of Particles per c.c., by Count	
1	96	950,000	1,160,000	0.82
2	102	650,000	760,000	0.86
3	112	180,000	224,000	0.81
4	63	2,980,000	3,040,000	0.98
5	16	10,650,000	10,000,000	1.07
6	25	7,920,000	7,000,000	1.13
7	48	4,400,000	4,000,000	1.10
8	16.5	10,500,000	10,500,000	1.00
9	78	1,900,000	2,160,000	0.88
10	50	4,150,000	4,030,000	1.03
11	97	900,000	760,000	1.18
12	108	380,000	384,000	0.99

Note: Samples 1 to 8 are impinger samples collected from dust chamber. Samples 9 to 12 are impinger samples collected from the brick plant.





## EFFICIENT HEAT TREATING

**T**HERE is one manufacturer, the Leeds & Northrup Co., Philadelphia, that makes full use of its own equipment to aid in the economic production of more of the same type of equipment.

The new department for tool and production heat-treatment at Philadelphia is probably one of the most compact and efficient in the country. All the furnaces are arranged in a semi-circle, of 9 ft. 3 in. radius, in front of a control board carrying indicating and recording instruments. All the instruments and furnaces are standard production items of the L. & N. company. The compact but still far from crowded layout is apparent in the accompanying illustration, and the arrangement permits the heat-treater to work with unusual speed and efficiency.

Along the arc, reading from left to right in the accompanying illustration, are the following pieces of heating and quenching equipment:

- (1) An oil quench tank, using Houghton's No. 2 soluble oil.
- (2) A Vapocarb-Hump controlled-atmosphere electric hardening furnace; this is equipped with a cracking furnace for converting Vapocarb fluid from an overhead tank into furnace atmosphere.
- (3) A brine quenching tank.
- (4) Another Vapocarb-Hump furnace with cracker.

- (5) An oil quenching tank.
- (6) A Hump natural-atmosphere hardening furnace.
- (7) A brine quenching tank.
- (8) A Homo forced-convection electrical tempering furnace. (The heat-treater has this furnace open in the illustration.)
- (9) A running water wash tank.
- (10) Another Homo forced-convection tempering furnace.
- (11) And in the corner an alkali cleaning tank.

The control panel carries Micromax recording controllers for the five furnaces. The entire equipment represents an investment of approximately \$9,000, and the installation permits one heat-treater to handle all tool and production heat-treating for a plant employing 1100 people.

Each of the Vapocarb-Hump furnaces (2) and (4) has a chamber 12 in. in diameter and 16 in. deep, and is rated at 11.6 kw. each, for furnace and cracker. These furnaces are used for annealing, for controlled hardening and for carburizing. The furnace operates at temperatures up to 1850 deg., which is the range in which many of the high-carbon and high-chrome steels are treated. These furnaces handle the carburization of SAE 1020 cams, punches, dies, jigs, bushings, ratchet wheels, pawls, worms, etc., practically all of which are oil quenched to a hardness in the neighborhood of

Rockwell 63 to 65 C. These parts are either used in or used to make integral parts of L. & N. instruments. The same furnaces using a protective atmosphere, are used to heat straight-carbon or spring steel shafts, springs, washers, bushings, etc., which are brine quenched to an initial hardness of Rockwell 64 to 65 C and drawn in the Homo furnaces to whatever hardness the particular part requires.

The somewhat older type of furnace, the Hump furnace (6), uses no specially prepared atmosphere. Only small and miscellaneous odds and ends, made of straight-carbon steels are handled in this furnace.

The tool-type Homo tempering furnaces (8) and (10) are of the open coil type and operate up to 1200 deg. F. Each is rated at 12 kw. maximum for the heater, with an additional  $\frac{3}{4}$  kw. for the motor. They are used for tempering iron and steel parts and for heating of non-ferrous metals such as brass, copper, bronze and aluminum, all of which are later quenched in water. The brass parts are for the most part supports and tapped inserts; duralumin is handled in the form of condenser plates and clamps, galvanometer pointers, clutch arms, etc.; copper alloys are in the form of tubing and inserts etc. Some beryllium copper springs also are treated in these units.

# CLEANING

By C. C. HERMANN and R. W. MITCHELL\*

THE still tank method for cleaning metal parts is the oldest method with respect to physical arrangement, lowest in initial investment but usually highest in labor cost of operation. It is, nevertheless, widely used in the smaller plant today, and with advanced knowledge of the cleaning function it serves its purpose very well. Because of the expense of the labor item in cleaning operations of any kind and in particular with cleaning of metal parts in the process of manufacture, the tendency is toward automatic and semi-automatic equipment and especially toward labor saving devices in connection therewith.

The tank used for still cleaning depends primarily on the type of cleaning to be performed and the size as well as the contour of the articles to be cleaned. In Fig. 1 is shown the tank equipment required for a moderate size plant. The arrangement consists of the pickling tank, cleaning and rinse tanks, all of wood construction. In Fig. 2 is shown a wood tank under construction at the Mack Mfg. Co. plant located at New Brunswick, N. J. This tank construction is very popular and consists of 2½-in. thick long-leaf yellow pine, tongue and grooved outer shell held together by heavy brass bolts and rods. The inner lining is also wood but 1¼ in. thick. All joints are filled with asphalt and asphalt is also applied to the wood surface between the outer and inner tanks. Since wear comes entirely on the inner lining, a repair consists of the replacement of this lining when required. By this construction, maintenance as well as complete replacements are kept at a minimum.

\*Technical director, Magnus Chemical Co., Garwood, N. J.

Heat may or it may not be applied to the regular cleaning and pickling installation. However, it is conceded that the application of heat shortens the time cycle for the operation and should be used in the pickling tank if possible and is almost essential in the cleaning bath when certain solutions are used.

Oil, grease and other foreign matter are not removed by the pickling operation. Therefore an alkaline cleaner

50 per cent for continuous agitation and aeration. One of the more common ways of obtaining agitation is by moving the work up and down in the bath. This may be performed by the use of a rope and block or by any one of a number of different ways. In Fig. 4 is shown a view in a large pickling shop where agitation by use of an electric hoist is obtained. The work is transferred to the pickling operation on an overhead trolley system, then lowered into the bath by a hoisting section of the trolley after which it proceeds through the remaining operations in the same way. This method not only provides a suitable means for agitation but also serves as a transport system for the material. Thus, labor costs are reduced materially.

Where agitation and heating are used, ample means for ventilation must be incorporated in the equipment. It has been fully demonstrated that ventilation dependent on natural draft is insufficient. Forced ventilation by means of scientifically designed hoods and duct work incorporating a fan is a good investment. In Fig. 5 is shown a hood design which is correct for the purpose, is economical in fan horsepower to obtain a given ventilation effect and is reasonable in first cost. The ventilation effect is nearly uniform for all points on the face of the hood, a feature of considerable importance in the ventilation of quench tanks.

For alkaline solutions or alkaline salts, except cyanides or sulfides, steel may be used in the tank construction. In the case of the latter, steel may be used if heavily coated with asphaltum or acid resisting paint. Lead lined steel tanks or rubber lined steel tanks

## **F**OURTH in a Series of Articles on the Economic Aspects of Metal Cleaning and Finishing

should be used preceding the pickling. Electric cleaning, which will be discussed in a future article, is also used preceding the pickling operation.

The manner of applying the heat to the liquid depends upon the facilities available as well as the nature of the bath. It is unwise to connect the coil, immersed in an acid solution, to the vacuum return system. Therefore coil heating of the acid bath is usually uneconomical because the pressure required for steam jet systems must be high. This precludes the use of exhaust steam. The jet heater is also objectionable due to continuous dilution of the bath which results in loss of bath control. Placing of the steam coil directly in the tank liquid and providing it with a baffle, such as that shown in Fig. 3, and piping the condensate to waste is the usual procedure. This type of installation also provides agitation of the bath, which is desirable.

Agitation and particularly aeration of the solution increases the pickling rate, the time being cut as much as

# OF METALS

*OLDEST metal cleaning process is the still tank method.*

*Original cost is low, but labor costs are high; to reduce the latter there have been developed automatic and semi-automatic machines, all of which are described herein*

may be used for acids but will not stand up well in caustic solutions—plain steel is better for caustic solutions. The steel tank should be of sufficient heavy gage to stand the mechanical abuse, preferably of 10 gage or heavier, and with all joints welded. The riveted tank is often troublesome due to leaks at the joints and must be thoroughly caulked or supplemented by welding.

Since pickling does not remove foreign matter from the surface of the work a cleaning operation must be introduced. Cleaning of the metal surface has become a very important phase of manufacture. On cleaning depends the surface appearance of the finished article which affects sales to a very appreciable extent, but also on cleaning rests a portion of the production costs which also affects sales in a competitive market. In many types of industry cleaning affects the fit of one part with another to a very large extent, and cleaning is almost essential wherever parts are finished and inspected. For example, in the manu-

facture of ball and roller bearings there are no less than eight cleaning operations involved between the first rough machine cut and the boxed bearing.

It is not always necessary to obtain a chemically clean surface; therefore, cleaning is a matter of degree. For instance at the SKF Industries, Inc., plant in Philadelphia, some cleaning operations are only intended to remove the larger percentage of the oil and grease between subsequent operations. One of these is the washing of ball races between the oil quench bath following the hardening operation and the tempering operation done in L. & N. electric furnaces. The quench oil must be removed prior to the parts going into the electric furnace as a matter of reducing the maintenance cost of the heating elements; therefore, the parts are given a 70 per cent wash in a soda solution using 2 oz. per gal. of water. The temperature of the solution is maintained at 150 deg. F. About 8000 lb. of material are handled per hr., the handling taking

place by means of an overhead trolley system and an electric hoist.

To clean the surface, the cleaning solution must be capable of wetting that surface. Perhaps water or the ordinary liquids used in cleaning do not wet; in such instances, something must be added to the solution to produce this wetting effect. The addition to the liquid must not only be the proper wetting agent for the particular foreign matter on the surface, but it must penetrate that matter if it is to be thoroughly removed. Since most



AT LEFT

FIG. 1—Pickling tank, cleaning and rinse tanks, all of wood construction. This is the arrangement favored by moderate size plants.

o o o

AT RIGHT

FIG. 2—Wood tank under construction. All points are filled with asphalt.





matter on metal surfaces is oil, grease and mixtures of these with mineral and vegetable matter, usually called dirt, the cleaner must possess the power to penetrate the dirt, suspend it for carrying it away and to emulsify the oil present.

A characteristic of all liquids is a surface skin. For example water forms drops or globules as though the liquid were in a bag. Penetrate the bag with a pin and the drop of water flows down the pin, bag and all. However, that bag is a sort of water skin bag, which effect, for want of a better name, is called surface tension. It is this surface tension of water which makes it possible for water to form drops, needles to float on the surface, oil to spread in a thin layer over the surface, etc.

It is thus well understood that all liquids as well as other matter possess a surface which bounds them. To

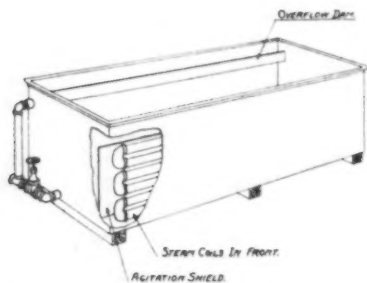


FIG. 3—Usual procedure of heating the bath. The steam coil is provided with a baffle.

cause two liquids to mix, this boundary or "interfacial tension" of the two liquids must be broken down in its entirety. Cleaning is essentially a matter of decreasing the interfacial tension of the combination of elements considered, and the substance which produces the greatest decrease of the interfacial tension is the best detergent.

In tank cleaning, the concern is with cleaners in water solution which do not evaporate, such as solvents do. Alkalies are not considered to be good cleaners, however; they become useful when used in conjunction with other chemicals which increase the capacity of the cleaner to emulsify, deflocculate and suspend dirt in solution so that such materials may be readily removed by a rinse. Most of these cleaners, used today, are a combination of alkali and soap. Their alkaline range of action is measured in pH units.

The nature of the dirt to be removed from the surface must be given ample consideration in selecting the proper pH range of the cleaner. Those

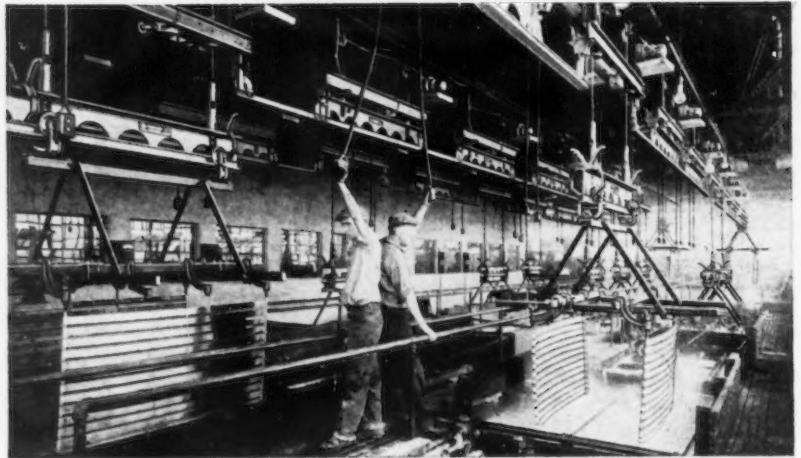


FIG. 4—In this shop agitation of the bath is obtained by means of an electric hoist.

familiar with industrial products readily recognize in most of the dirt certain percentages of mineral oils along with other matter spread on the parts by handling, laying on the floor, etc. Much of the matter is fatty oil which can be removed by the use of any one of several alkaline materials such as caustic, soda ash and others. However, the quicker results are obtained by the use of a cleaner in which fatty oils are saponified, forming soaps. Since the amount of soap formed by reaction with fatty matter in the dirt itself is usually inadequate to perform a satisfactory cleaning it is necessary to add helps in the commercial metal cleaners. This is to give the proper amount of soap for speedy, thorough action.

Depending upon the metal and the type of dirt, the pH of the cleaning solution should be planned to vary from 9 to 13. For instance, materials high in fatty matter as stearic acid

in buffing compounds, or grease in drawing compounds, usually emulsify and leave the surface best in solutions of low pH, from 9 to 10. Strongly alkaline solutions set such dirt up to sticky, slowly soluble soaps which dissolve off only very slowly. Straight mineral oils come off best at high pH, as for instance 13. Aluminum, zinc, or soft metal alloys must be cleaned in solutions of low pH to avoid alkaline corrosion, that is from 9 to 10.5. Brass must be cleaned at not over pH 12.5 to avoid heavy tarnish. Steel or iron are the only metals safe to clean in solutions of high pH. It is advantageous to work with solutions of as low pH as will do the work; for the more alkaline a solution is the more disagreeable it is to work with and the greater will be the hazard from splash or drip. Moreover, solutions of low alkalinity rinse better than those containing caustic alkali.

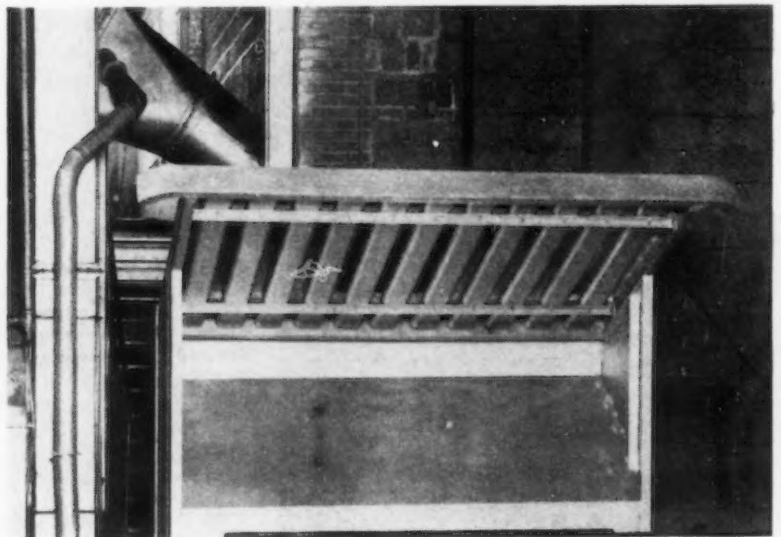


FIG. 5—This hood design gives nearly uniform ventilation at all points over the face of the hood.

# Centrifugal Casting of Metal and Alloys



By J. E. HURST  
*Lichfield, England*

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THE application of the centrifugal process for the purification and refining of pig iron may be regarded as a development of the centrifugal process for the production of castings.

Perhaps the most striking evidence of the effect of centrifugal action on the particles of undissolved material present in cast iron is to be had from its effect upon the manganese sulphide. Manganese sulphide is undissolved in molten cast iron at the temperature at which cast iron is ordinarily melted. The specific gravity of manganese sulphide at casting temperature is substantially less than that of cast iron.

Under these circumstances it may be expected that manganese sulphide will be separated to the inner surfaces of cylindrical castings made under the influence of centrifugal action. That this is so may be amply demonstrated by a sulphur print taken from the cross-section of a centrifugal casting, which will show clearly how the manganese sulphide constituent is concentrated in the inner surface. In a like manner other undissolved matter, having a lower specific gravity than that of the liquid metal, such as slag particles, insoluble oxides and the like, are effectively separated.

IN this the second section of a two-part article, the author describes the use of the centrifugal casting process in the refining of pig iron. Last week, Mr. Hurst discussed the history and present status of various centrifugal casting procedures.

• • •

The effect of mechanical movement on the separation of undissolved particles from molten metal and the refinement of the grain structure in the final solidified metal has been recognized for a long time. Mechanical methods of stirring, rocking and vibration have been proposed, particularly for use in connection with cast iron. Some years ago considerable prominence was given to a shaking or jolting apparatus. In the most advanced design of this apparatus invented by the Continental engineer Duchesne, an oil-fired receiver was used, mounted on a frame and arranged to be capable of jolting by means of a rotating cam device very

similar in action to that of a mechanical jolt ramming machine. The effect of the quick succession of jars on the molten metal in the receiver was claimed to effect considerable improvement in the quality of the castings produced, and this was ascribed partially to the degasification effect due to the vibration. This process was described by Irresberger in the *Foundry Trade Journal* July 22, 1926. Quite recently in connection with the promoting of soundness and closeness of grain in steel ingots an arrangement has been patented by a German engineer in which the liquid steel is subjected to very high frequency vibration of audible frequency.

## Degasification Promoted

The centrifugal process may be regarded as a special case of mechanical movement and its use has been proposed for the purification of such metals as lead and copper. Many of the early patent applications relating to the centrifugal process had as their object the promotion of soundness, this being understood to be brought about by the condition of centrifugal pressure. Quite a number of attempts have been made to utilize the effect of the centrifugal action in the refining

of the grain size and the elimination of sulphur and other undissolved matter in both steel and pig iron. Mechanism for the rotation of steel ingot molds filled with molten steel has been designed with this object in view in addition to attempting to improve the soundness of the ingots as a whole by the reduction in the amount of the pipe.

A very early attempt in connection with steel was proposed by Sir Henry Bessemer in his patent No. 2819 dated 1859. In this patent it was proposed to pour the metal onto a rapidly rotating table or surface rotating within the enclosure of a mold casing. Under these conditions, by reason of the centrifugal action the molten metal was "thrown outwards in the state of globules, the extrication of gaseous matters from it being thereby favored." The outer revolving mold enclosure formed the mold where the globules collected.

It is clear that this attempt to subject molten steel to centrifugal action was designed primarily to promote degasification, and it is probably true that the agitation which molten metal receives when subjected to such action does bring about disengagement of the dissolved gases.

#### Several Processes Developed

During more recent years there have been several processes designed for the utilization of centrifugal action in the purification of pig iron. One of these, due to the Russian metallurgist N. N. Jarotsky is described in the German patent D.R.P. 470/195 dated February 1926. The diagram in Fig. 5 will serve to illustrate the principles involved. A specially shaped container or ladle is arranged to be capable of rotation by means of the spur gearing attached to the base. This container, lined with suitable re-

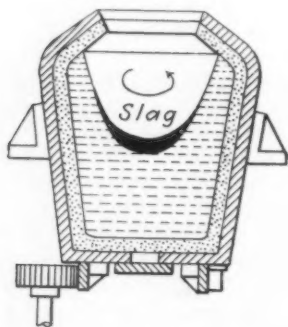


FIG. 5—Centrifugal process for the purification of pig iron, as developed by Jarotsky.

fractory material is filled with molten metal and rotated. Under the influence of the rotation both the gases, sulphides, and included slag particles are concentrated in the base of the paraboloidal depression of the liquid surface due to rotation and may remain on the surface of the molten metal after the rotation has subsided, the gases of course being liberated. By careful pouring or by bottom pouring of the ladle the purified metal is separated.

Another process of centrifugal purification is due to the Belgian engineer

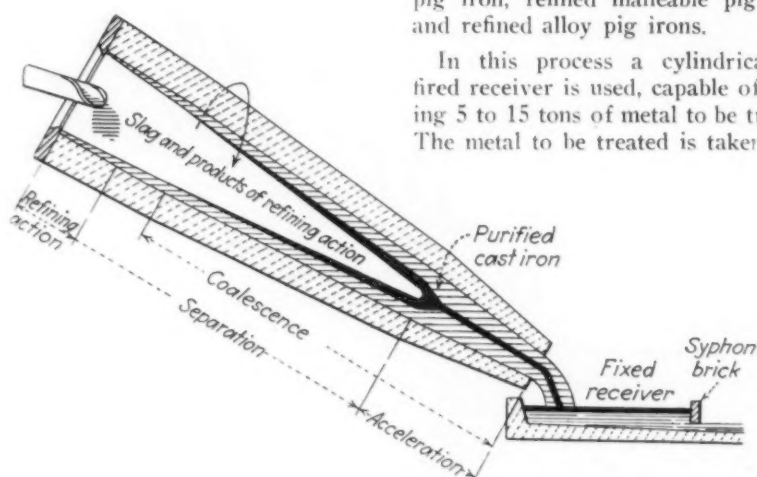


FIG. 6—Centrifugal process for the purification of pig iron, as developed by Vroonen.

M. E. Vroonen, and has been described in his paper before the International Foundry Congress at Brussels in 1935. The essential portion of the Vroonen apparatus consists of a conical tube lined with suitable refractory material and capable of being rotated. The mode of operation will be understood by reference to the diagram illustrated in Fig. 6.

In this apparatus the molten metal is delivered into the rotating conical tube as it issues from the melting furnace. The rotating tube is inclined and under the influence of centrifugal action induced by the rotation, the molten metal tends to distribute itself and flow down the tube in the manner indicated in the diagram. The molten metal during its passage through the rotating tube can be treated with refining slags, as for example sodium carbonate.

This material is added as the metal enters the tube and the intimate contact obtained between the sodium carbonate and the molten metal at the mouth end of the tube ensures the effective absorption by the slag of the

sulphides and other suspended matters. As the metal flows towards the delivery end of the tube the slag formed tends to separate, and the molten metal and slag are delivered into a stationary channel fitted with a kind of skimming brick designed to retain the slag and allow the purified metal to flow into the molds.

A centrifugal purification process operated in England by Bradley & Foster Ltd. is a development of their earlier degasification process described in the *Foundry Trade Journal*, April 9, 1931. This process is applied to the production of high grade refined pig iron, refined malleable pig irons and refined alloy pig irons.

In this process a cylindrical oil-fired receiver is used, capable of holding 5 to 15 tons of metal to be treated. The metal to be treated is taken from

the refineries and maintained at a suitable temperature in the oil-fired receiver. A modified form of powerful stirring device is introduced into the molten metal. This device consists essentially of four vertical rods coated with a suitable refractory coating and arranged to rotate in the molten metal by a constant and uniform peripheral speed. By this rotation the metal is first agitated and then steadily acquires a uniform rotational velocity. In actual practice this velocity is arranged to a peripheral speed of about 400 ft. per min. During this treatment the addition of suitable refining slags is made and these absorb the separated sulphides and slag materials. The impurities and sulphur contents, separated, are absorbed by the molten slag in contact with the metal during centrifuging. After this operation the metal and slag subside, forming two layers and the purified metal can be tapped off readily.

The diagram in Fig. 7 illustrates the principles embodied in this process. The early stage of this process brings about considerable turbulence which is claimed to have an effect in causing



degasification. The later stage accompanied by uniform centrifugal movement brings about separation of the dissolved impurities and the process as a whole obviously ensures thorough mixing of the molten metal.

Modern research in connection with cast iron continually emphasizes the importance of fine grain structure and fine graphite structure. The application of the centrifugal process in addition to bringing about purification by the separation of the undissolved impurities may be regarded as a method of ensuring fine grained and fine graphite structures in addition to ensuring complete admixture and uniformity of composition in the molten metal.

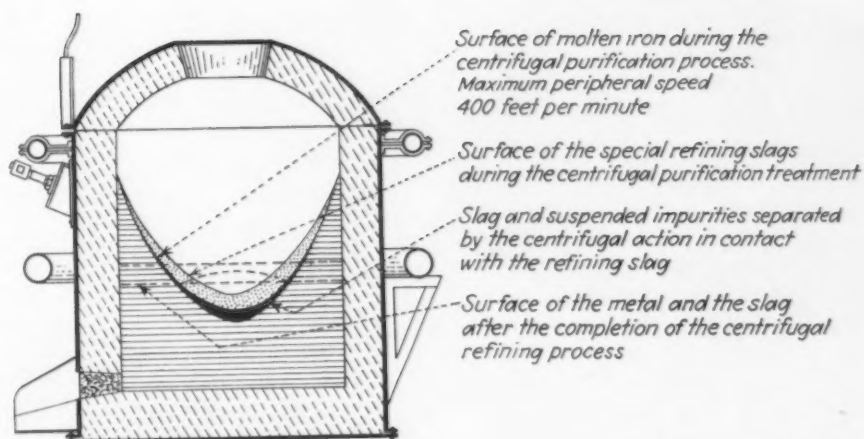


FIG. 7—Centrifugal process for the purification of pig iron, as developed by Bradley & Foster Ltd.

## Soft, Semi-Bright Nickel Electroplate

**A** NEW soft, semi-bright nickel alloy electroplate is now being produced commercially by a process of the Hanson-Van Winkle-Munning Co., Matawan, N. J., manufacturer of electroplating equipment and supplies. This process was developed to supply a need which has not been fully met by either the bright nickel heretofore available or by the conventional gray nickel deposits.

Bright nickel deposits, as generally known, are inclined to be somewhat hard. They are widely used because of the savings which they effect by the elimination of most and, in many cases, all of the buffing on the deposited metal, although a part of this saving is lost in the additional buffing and coloring necessary on the base metal. In those cases where it is advisable to touch up the deposited nickel, difficulty is often encountered by reason of the hardness of the deposit.

### Properties

The new soft coating described herein is nearly as bright as the typical bright nickels; at the same time, it is said to flow under pressure on a buff much more easily than either the standard gray nickel or bright nickel. Only the lightest "fanning off" on a loose, medium-speed buff is required to give the deposit a fine deep lustre. The light pressure on the wheel eliminates the danger of cutting through the deposit on cor-

ners and projections. The deposit is extremely ductile, and will stand mechanical forming operations without flaking or peeling, having excellent adherence, even when deposited directly on iron or steel.

Under properly controlled conditions, this deposit on buffed copper or brass may be lustrous enough to go directly into the chromium tank without buffing, but average practice calls for heavy deposits at high current densities followed by a light coloring operation before chromium plating.

The salt spray resistance of the deposit is said to be excellent, and it will take chromium plate nicely without extra treatments.

### Operation

The electrolyte used is an adaptation of the Weisberg and Stoddard cobalt-nickel solution, made by the removal of the sodium salts, a reduction in the ammonium salt content of the solution, and lowering the cobalt content of the anode. The nickel anodes are of the cast carbon type, containing a small percentage of cobalt. The solution operates between 2 and 4 pH, at temperatures between 140 deg. and 180 deg. F. Brightness of deposit is increased by using higher temperatures with lower pH values. The maximum brightness is obtained by agitation, by air or mechanically. However, for heavy deposits on steel,

where a slightly gray color is not objectionable, agitation is not indispensable. The throwing power of the solution is best at the higher pH levels.

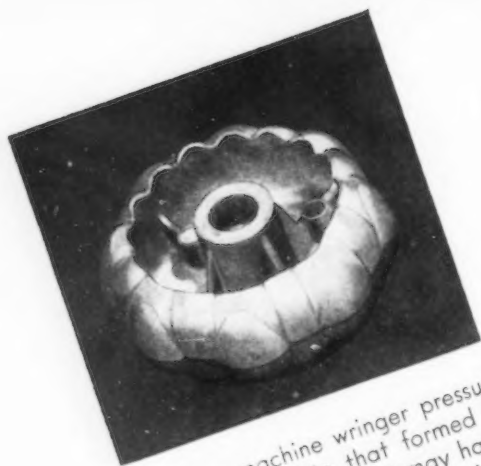
Current densities as high as 75 and even 85 amp. per sq. ft. can be employed by the use of proper racks and sufficient agitation. Brighter deposits are obtained at the higher current densities.

Constant filtration is very important. The solution must be kept free of even small amounts of impurities like lead, copper, zinc or iron, although these impurities can easily be removed by plating out at low current density. Certain organics are also objectionable but they can be removed by treatment with hydrogen peroxide and filtration through activated carbon.

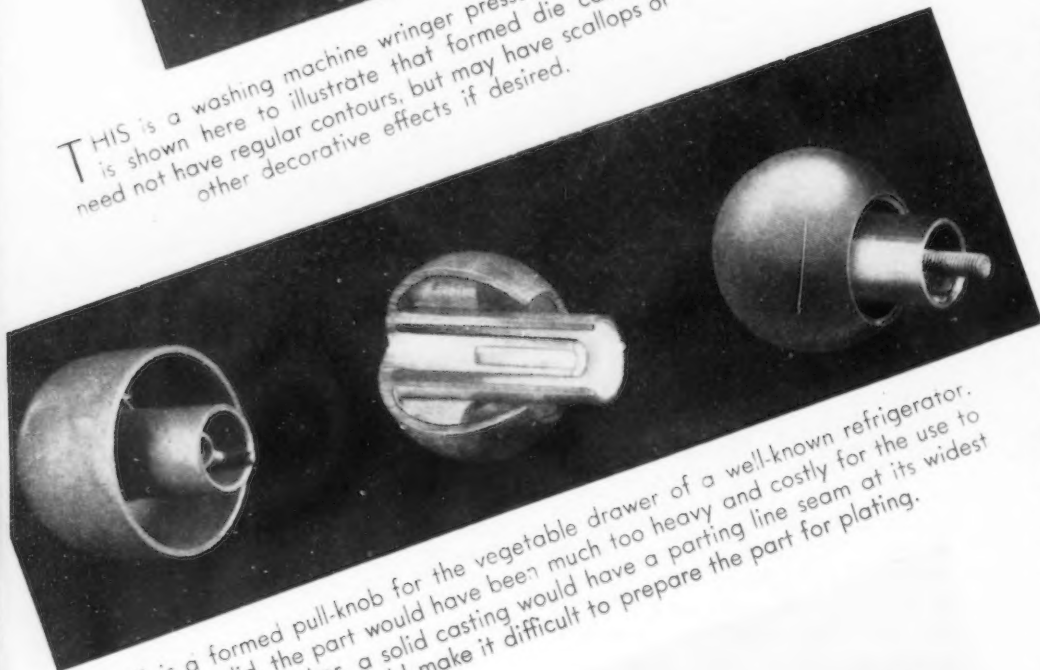
This solution uses no wetting agents and is consequently free from the disadvantage of susceptibility to contamination by oils and greases which are dispersed throughout the ordinary bath by the wetting agents.

Savings are claimed by the reduction in buffing labor and the buffs and compositions consumed in coloring up the deposit. Many instances have also been reported in which fewer polishing operations are necessary before plating, still achieving the same lustre after nickel coloring. The cost of operating the solution is considerably less than that of bright nickel.

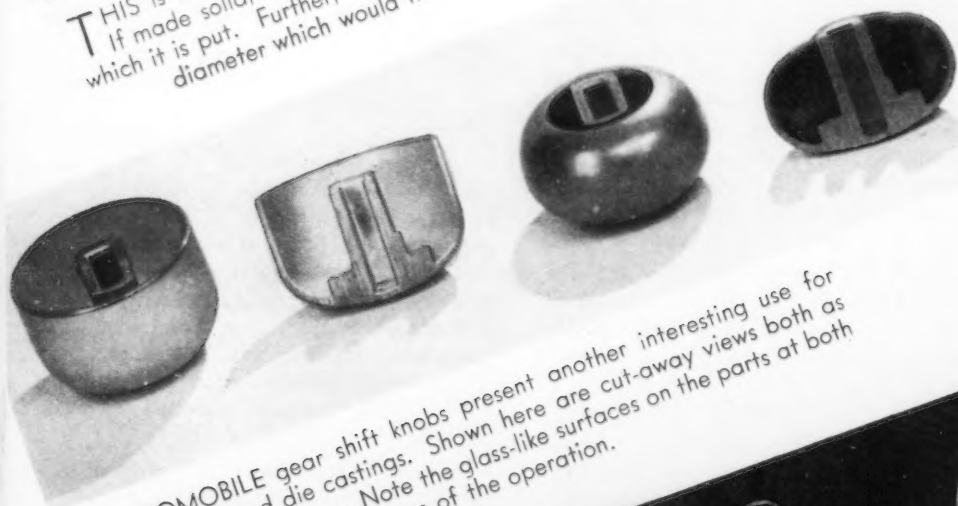
# NEW METHOD OF C



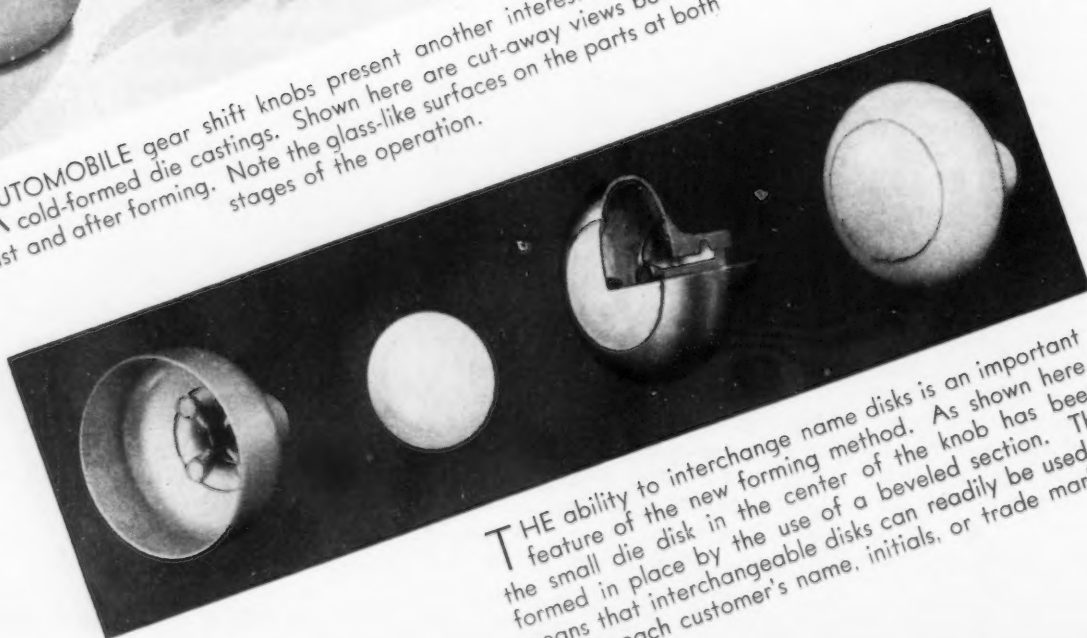
THIS is a washing machine wringer pressure knob. It is shown here to illustrate that formed die castings need not have regular contours, but may have scallops or other decorative effects if desired.



THIS is a formed pull-knob for the vegetable drawer of a well-known refrigerator. If made solid, the part would have been much too heavy and costly for the use to which it is put. Further, a solid casting would have a parting line seam at its widest diameter which would make it difficult to prepare the part for plating.



AUTOMOBILE gear shift knobs present another interesting use for cold-formed die castings. Shown here are cut-away views both as cast and after forming. Note the glass-like surfaces on the parts at both stages of the operation.



THE ability to interchange name disks is an important feature of the new forming method. As shown here, the small die disk in the center of the knob has been formed in place by the use of a beveled section. This means that interchangeable disks can readily be used to carry each customer's name, initials, or trade mark.

ALTHOUGH the past few years have witnessed constant advancements in the die casting process to widen the range of applications for die castings, such as those made from zinc alloys, occasionally a designer or die caster brings about an innovation that immediately opens virgin avenues of usefulness for this versatile production process. The method of cold forming discussed here is one of the most recent of these extremely valuable advances in increasing the versatility of the die casting process.

One of the limiting factors of the die casting method of production, as applied to the production of handles, knobs, wheels, and other parts of circular, spherical, or irregular tubular shape, has been the inability to obtain closed hollow sections. To date, it has been essential that the walls of a hollow die-cast part be in straight section to avoid undercuts and to permit the removal of cores from the casting die.

With the new method of cold forming developed by the Doehler Die Casting Co., it now becomes feasible to cast a part in straight section and to subsequently form the casting to the desired shape. This means that hollow parts now can be produced as zinc-alloy die castings, with all of the inherent physical and economical characteristics of the metal and process.

The advantages of the cold-formed die-cast parts are numerous. First, there is a decided saving in weight

# OF COLD FORMING

and, due to the extremely thin walls obtainable, an increased rate of production.

Second, these parts present new possibilities for machining and assembling economies, through the ability to obtain integrally cast lugs and bosses. Formerly, a knob or handle was cast solid or required assemblies of stampings, screw machine parts, etc.—now they may be produced in one piece.

Third, this new method simplifies finishing problems, particularly if a part is to be plated. It is generally accepted that superior finishing can be secured on parts having thin, uniform walls as against those of solid, heavy sections. Then, too, all of the examples shown on these two pages, if cast solid, would have parting line seams at the largest diameter. This would mean a grinding operation prior to buffing, which is not necessary with the cold formed parts. The parting line on parts fashioned in this way is entirely removed in the trimming operation. This results in a surface free from parting line seams—there is an unbroken surface that can easily be brought to a high luster by buffing alone.

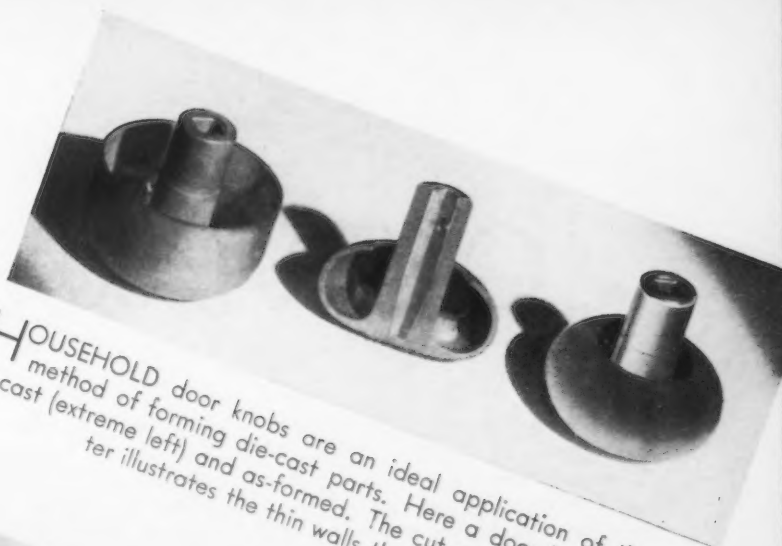
The captions under each of the illustrations require careful reading; for only in that way may full appreciation of the design possibilities offered by zinc-alloy die cast cold formed parts be realized.

*Photographs courtesy of the Doehler Die Casting Co.*

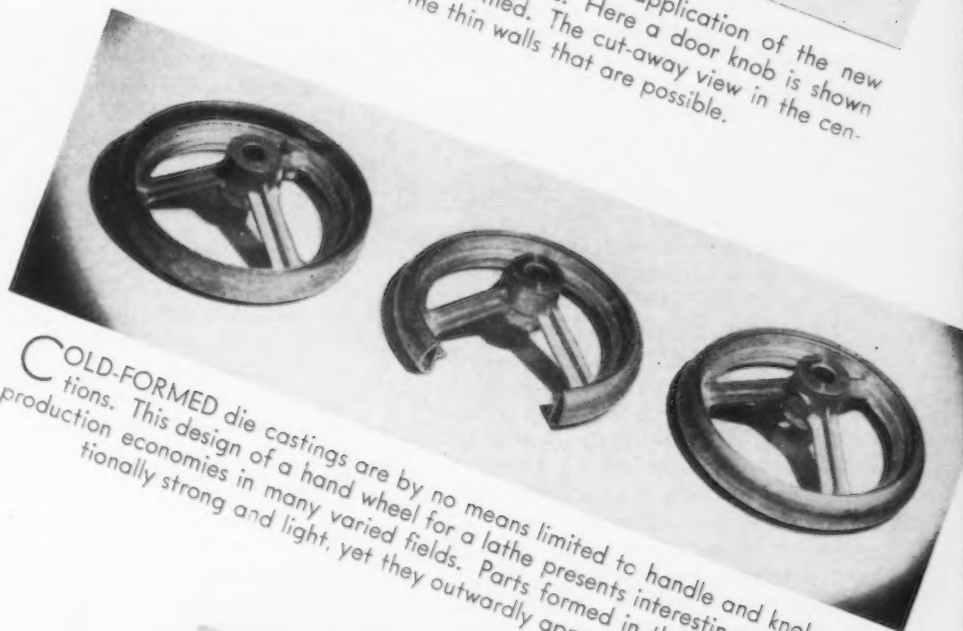
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## AT RIGHT

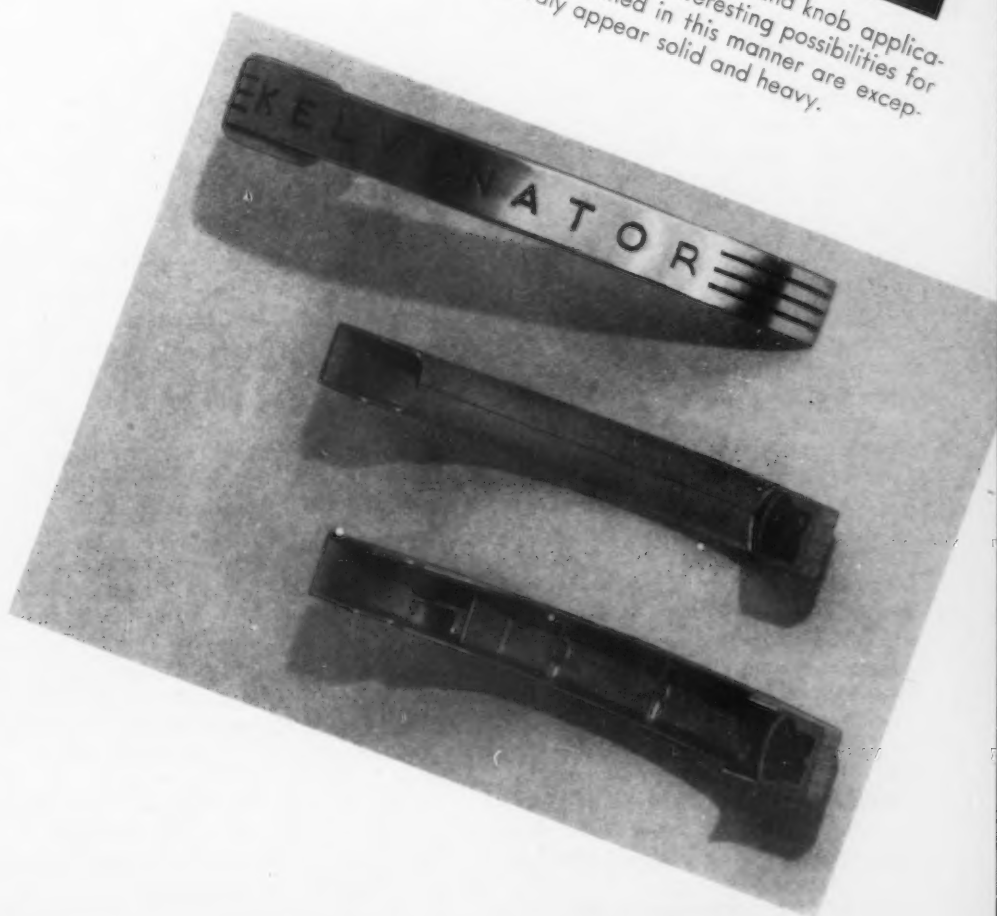
It is a simple matter to secure clean cut engraving and decorative designs with formed die castings, as is illustrated by this refrigerator handle. To the user, this handle has the same feeling of solidity as it would have if cast solid.



HOUSEHOLD door knobs are an ideal application of the new method of forming die-cast parts. Here a door knob is shown as-cast (extreme left) and as-formed. The cut-away view in the center illustrates the thin walls that are possible.



COLD-FORMED die castings are by no means limited to handle and knob applications. This design of a hand wheel for a lathe presents interesting possibilities for production economies in many varied fields. Parts formed in this manner are exceptionally strong and light, yet they outwardly appear solid and heavy.





# OVER 1400 REGISTER FOR

THE combination of 23 technical sessions, an unusual number of round-table discussions, an exhibit of testing apparatus and related equipment, and the normal early-summer attractiveness of Atlantic City served to draw well over 1400 members of the American Society for Testing Materials to "America's playground" last week for the forty-second annual meeting of the organization. This registration established an all-time record for Atlantic City meetings, and has been surpassed only once, and that by the combined meeting and exhibit at New York two years ago.

Both the variety of technical papers and the excellence of the weather during the five-day period, June 26-30 inclusive, left nothing to be desired by those attending. In the 23 technical sessions (including several round-table discussions) there were presented upward of 110 technical papers and reports covering important topics in the field of standardization, research and testing of engineering materials. Among important items on the program were the annual address by the retiring president, T. G. Delbridge, whose subject was "Glimpses at Petroleum," and the fourteenth Edgar Marburg Lecture which was delivered by Prof. H. F. Moore and dealt with "Stress, Strain and Structural Damage." For many years manager of the research and development department of the Atlantic Refining Co., Dr. Delbridge has taken a leading part in technical developments in the testing and refining of petroleum products. His address covered the highlights in this field, particularly some of the newer developments.

H. F. Moore, professor of engineering materials at the University of Illinois, pointed in his lecture to many kinds of structural damage and indicated in some phases at least the complicated structure of materials. A very significant portion of the lecture dealt with the value of common test results as prophecies of resistance to structural damage.

Following the Edgar Marburg lecture, the award of the Charles B. Dudley medal was made; this medal commemorates the name of the first

president of the Society, and is awarded to the author of the paper which is of outstanding merit constituting an original contribution on research. The recipient was Dr. R. W. Carlson, associate professor of civil engineering at M. I. T., the paper being "Drying Shrinkage of Concrete as Affected by Many Factors," which was presented at the 1938 annual meeting.

New officers of the A. S. T. M. are as follows:

President: H. H. Morgan, manager of the rail and track fastening department of the Robert W. Hunt Co., Chicago.

Vice-President (2-yr. term): G. E. F. Lundell, chief of the chemistry division of the National Bureau of Standards, Washington.

Members of the Executive Committee (2-yr. terms.): J. J. Allen, chief chemist of the mechanical rubber goods division, Firestone Tire & Rubber Co., Akron; R. D. Bonney, assistant manager of manufacturing, Congoleum-Nairn, Inc., Kearny, N. J.; T. S. Fuller, engineer of materials, Schenectady Works laboratory, General Electric Co.; J. L. McCloud, metallurgical chemist of Ford Motor Co., Dearborn, Mich.; and M. A. Swayze, director of research, Lone Star Cement Co., Hudson, N. Y.

One of several formal papers for the session on "Iron" on Tuesday morning dealt with "Mechanical Properties of a High-Strength Cast Iron," by J. O. Draffin and W. L. Collins, of the University of Illinois. This paper presented the results of tests on a high-strength cast iron. The tests closely parallel similar tests of a low-strength iron presented before the Society in 1937 and 1938; wherever feasible, comparisons between the two types of iron were made. Tests were made in (1) tension, on solid and hollow specimens; (2) compression, with specimens having length to diameter ratios of 3 and 6; (3) torsion, with solid specimens  $\frac{3}{4}$  in. and 1 in. in diameter and with hollow specimens of various wall thicknesses; (4) repeated stress in completely reversed torsion with and without a hole; and (5) bending of solid rectangular and H-beams. Strain



H. H. MORGAN

New President of the American Society for Testing Materials

readings were taken on nearly all specimens except those tested under repeated torsion. Measurements were made to determine Poisson's ratio for the top and bottom of each beam.

Another paper in the same session dealt with "Influence of Chromium on the Oxidation Resistance of Cast Iron," prepared by C. O. Burgess, of Union Carbide & Carbon Research Laboratories, Inc. The primary objective of this particular investigation was to determine the effect of various chromium contents on the oxidation resistance of cast iron. Eleven cast irons containing approximately 0 to 25 per cent chromium were employed, and during 360-hr. exposure periods heated and cooled from test temperatures of 700, 800, 900 and 1000 deg. C. A special technique was employed to insure comparable conditions and accurate determinations of weight gains. Data so obtained definitely indicated the percentage of chromium necessary at each temperature level to limit the total oxidation of cast iron. Progress-

# A. S. T. M. SESSIONS + + +



**G. E. F. LUNDELL**

New Vice-President of the American Society for Testing Materials

sive weight-gain curves at 800 and 900 deg. C. established the chromium content required to produce an inherent scale at these two temperature levels. Low-carbon control specimens indicated that carbon content has relatively little effect on oxidation resistance; and the role of chromium in inhibiting oxidation was clearly brought out by a metallographic examination. The penetration of an oxidation constituent, provisionally designated as metal-oxide, beneath the metallic surface of cast irons low in chromium was noted, and was believed to shed some light on the little understood phenomenon of growth.

A third paper, "Relation of Carbon Nodule Size and Tensile Properties of Malleable Cast Iron," was presented by H. A. Schwartz, of National Malleable & Steel Castings Co., and H. J. Schindler and J. F. Elliott, of Case School of Applied Science. This particular paper was read by C. H. Junge. A description was given of white cast iron being converted into malleable

irons varying widely in nodule number. It was shown that a great variation in nodule number has little effect on the tensile strength and yield strength but that a small nodule number is favorable to ductility.

## Low Temperature Properties

Tuesday morning was featured by a round-table discussion on the effect of sub-atmospheric temperatures on the properties of metals; one of two formal papers available for this session concerned itself with "Sub Size Charpy Relationships at Sub-Zero Temperatures," by H. Habart and W. J. Herge, of the National Tube Co. This paper described Charpy impact tests on eight steels at 70 deg. F. and sub-zero temperatures down to -150 deg. F. Standard and various sub-size specimens were broken at each testing temperature. In general, ferritic steels lost impact resistance, as measured on standard and two-thirds size specimens, when the testing temperature was decreased. One-half size specimens, also lost impact resistance, but not to the marked degree as larger size specimens. Smaller specimens showed practically constant impact resistance throughout the temperature range used. An austenitic 18 per cent chromium, 8 per cent nickel alloy had increasing impact resistance with decreasing temperature. The results of the test were summarized to show relationships between sub-size impact specimens and standard size specimens at each test temperature. A table of working values for relationship between the various specimen sizes at each testing temperature also was presented.

A second paper was devoted to "Factors Affecting Notch-Bar Impact Tests on Steel at Low Temperatures," prepared by Walter Crafts and J. J. Egan, of Union Carbide & Carbon Research Laboratories, Inc. In order to determine the reasons for lack of correlation between different makes of Charpy and Izod-type impact testing machines in tests at low temperature, this survey was made to evaluate some of the variables that might produce the differences. Tests at low temperatures of both Izod and Charpy types were

made on a machine in which the initial energy and velocity of blow could be varied independently. The notch radius and depth were also investigated to estimate sensitivity to accuracy of the specimen dimensions. The length of cantilever arm of an Izod machine was also studied. The results indicated a general, but not extremely accurate, correlation between different makes of machines, and a conservative use of the test for specification purposes was recommended.

## Fatigue and Corrosion

One of the Wednesday morning sessions dealt with fatigue and corrosion, there being four items dealing with fatigue and five covering corrosion. The latter included a report of Committees A-5 on Corrosion of Iron and Steel and B-3 on Corrosion of Non-Ferrous Metals and Alloys. The B-3 report was especially interesting because it gave the results of tests of galvanic couples after exposure of seven years at nine test locations representing various atmospheric conditions. Extensive data were presented on some 20 different metal combinations.

One of the formal papers was concerned with "Fatigue Tests of Wire" by C. P. Wampler, of A. O. Smith Corp., and N. J. Alleman, of the University of Illinois. In many applications the serviceable life of wire is terminated by fatigue failure. Testing machines necessitating a machined specimen do not give a true index of the endurance properties of wire because the effects of surface conditions are removed. In this paper a method was presented for testing straight wire with the original surface intact, and correlation of results, using a bridge wire and a low-carbon steel, were obtained on a second type of testing machine. The two types of wire testing machines were described, and also the machine for testing machined specimens. Results on a low-carbon steel rod and on a brass rod indicated that a tensile set of 0.10 per cent, sufficient to straighten some coiled wire, does not appreciably influence the endurance limit.

Another paper was "Fatigue Strength



of Machined Forgings 6 to 7 in. in Diameter," by O. J. Horger and H. R. Neifert, of Timken Roller Bearing Co. The Association of American Railroads is making extensive laboratory tests to determine the fatigue strength of full-size railroad car axles, and this paper formed a progress report on some of this work. It discussed rotating cantilever beam fatigue tests made on 31 steel forgings from the same heat of S. A. E. No. 1045 steel machined to a tapered test section having a diameter of 6 to 7 in. These specimens were tested in the as-forged condition without heat treatment but machined after forging to a smooth turned surface. Data were included on scale-size fatigue tests of  $1\frac{1}{2}$  and 0.3-in. diameter specimens. Metallurgical studies and profilograph records of surface finish supplemented the fatigue tests. A discussion to test results with reference to those of previous investigators was also given.

A further paper on fatigue dealt with "Fatigue Machines for Testing Structural Units," prepared by R. L. Templin, of the Aluminum Co. of America. Fatigue test of structural units such as joists, beams, columns, and frames, carried out under normal working loads, will give results which should be of considerable assistance in improving the design of such structural units so as better to withstand repeated service loads. This paper described in some detail three types of relatively large fatigue testing machines which have been designed for this purpose. The functioning and calibration of the machines were discussed in some detail and the results obtained from four years use were briefly indicated. A limited amount of test data was included.

Another paper dealt with "Atmospheric Corrosion of Non-Ferrous Metals and Alloys," by C. W. Borgmann, of the University of Colorado. The results reported by Sub-Committee VI on Atmospheric Corrosion, of the Society's Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys, covering the first three test periods (1, 3, and 6-yr.) were critically reviewed. The results of the weight-change measurements and the descriptions of the visual appearance were found to be of little use in forming a judgment regarding the relative corrosion resistance of the test materials. However, the results of the tests on change in tensile strength and percentage elongation were considered to be of considerable importance to the engineering profession. The limitations in any attempt to evaluate the results in terms of corrosion resistance at this



**H. F. MOORE**  
Edgar Marburg Lecture

time were thoroughly discussed. However, a rough division of the materials into three classes was made, subject, of course, to the limitations just mentioned.

### Steel and Ferroalloys

A session on Thursday morning covered steel, ferroalloys, and effect of temperature.

A highly interesting and fully discussed paper in this session dealt with "A Work-Brittleness Test for Steel," by H. W. Graham and H. K. Work, of Jones & Laughlin Steel Corp. The paper was presented by C. C. Henning, assistant general metallurgist. Various tests may be used to measure the effect of cold work on the hardness and brittleness of steel, but most of them are slow and laborious to use. A simple test was described in this paper for measuring the changes in these properties, particularly the embrittlement on cold working. It consists essentially of drawing a tapered specimen through a die, notching it at points representing various increments of cold work, and breaking it in an Izod impact machine. The resultant work-embrittlement curve is characteristic of a given heat of steel. Experience over a period of years has shown that the test furnished useful information as to the probable behavior of the steel during fabrication and service.

An additional paper concerned itself with "The Alloy Castings Research

Institute Test Block for Heat Resisting Alloys; Its History, Selection and Utilization," by O. E. Harder, of Battelle Memorial Institute. An earlier survey conducted by Battelle Memorial Institute to determine the opinion of foundries and testing laboratories regarding the most suitable type of test specimens for use with heat-resisting alloys in determining high temperature tensile properties and creep characteristics was reviewed. Some experiments on the use of a pot type of casting were also reported.

Further work at Battelle developed a wedge-shaped test block with a riser along the entire length but gated only at the bottom. The A. C. R. I. technical committee suggested modifying this block so as to introduce hot metal into the head or riser. The A. C. R. I. then proceeded to an evaluation of various kinds of test blocks, including end-headed round, A. S. T. M. B-4 block, keel block, star-gate, U-bar, side-head block and the block mentioned herein. These various blocks were compared with reference to ease of casting, soundness of specimens, mechanical properties of specimens, and the relative amount of metal to be melted to produce a given number of test specimens.

The wedge-shaped block which would produce four tension test specimens was adopted on the basis of these requirements. This paper described its utilization in testing three types of heat-resisting alloys which are usually designated as NC-4, CN-36 and NC-2, or 35 Ni-15 Cr, 25 Cr-12 Ni, and 60 Ni-12 Cr.

The final formal paper in this session dealt with "Nickel-Molybdenum-Iron and Related Alloys—Their Physical and Corrosion-Resistant Properties," by F. T. McCurdy, of Haynes Stellite Co. The paper pointed out that equipment for the newer chemical processes is constantly called upon to withstand higher temperatures and pressures and more corrosive reagents. Of the problems, brought on by these factors, hydrochloric acid corrosion is especially difficult. Until quite recently, few metals could withstand this acid, and then only under mild conditions. Four strong, nickel-base alloys have now been developed, however, which are suitable, and they were described by Mr. McCurdy. The first withstands hydrochloric acid of any concentration at temperatures up to 158 deg. F.; the second withstands boiling hydrochloric acid; and the third withstands wet chlorine at ordinary temperatures. Investigation has also led to a nickel-silicon alloy which is economical for sulfuric acid equipment.



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THEY SERVE TO  
ENRICH HUMAN LIFE

## NEW PLANT EXTOLS THE MACHINE

RIGHT. Entrance to the new office building of the Monarch Machine Tool Co. at Sydney, Ohio.

• • •

LEFT. Inscribed panel in the main lobby of the Monarch company's new building.



THE exhibit shown below depicted the refinements in food manufacturing that have been brought about largely by the machine. An expert glass worker, who formerly could make only 40 quart glass jars an hour, can now produce with modern machinery 600 an hour. Cans and cardboard containers are made with equal rapidity.

ONE of the exhibits at Monarch's open house held recently comparing one of the old Monarch lathes with one of the new type.



# MAKERS OFFER NEW DESIGNS IN SPOT

NEW types of portable gun and spot welders have recently been placed on the market, and a number of accessories have been introduced, including new forms of automatic timers for resistance welding operations. A smaller and a more simplified arc welding set are noted. There have been a number of new developments in welding electrodes, including stainless steel types. A coated rod has also been developed for gas brazing operations. Several new types of anti-spatter compounds have been added to those previously available.

• • •

MAGNESIUM is largely used in the construction of what is believed to be the lightest weight pincher type spot welding gun, announced by the *Progressive Welder Co.*, Detroit. Hydraulic in operation, it is designed for welding currents up to 50 kva. and pressures up to 1000 lb. Its light weight is intended to reduce operator fatigue, speed up production and improve general welding efficiency. Current is transmitted to the electrodes directly through the pressure cylinder and piston, an arrangement known as the sliding contact principle of current transmission. Cocking action of the piston within the cylinder increases the welding pressure and contributes to the high efficiency of the gun. More accurate location of the spot is also said to result from this design.

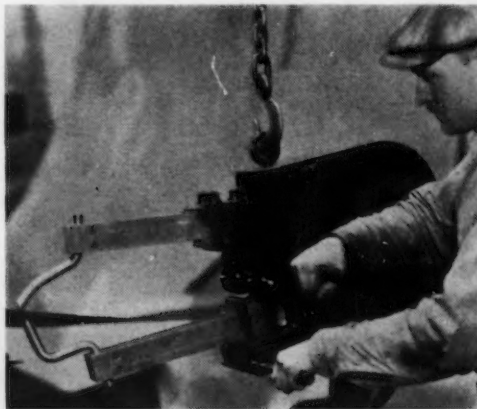
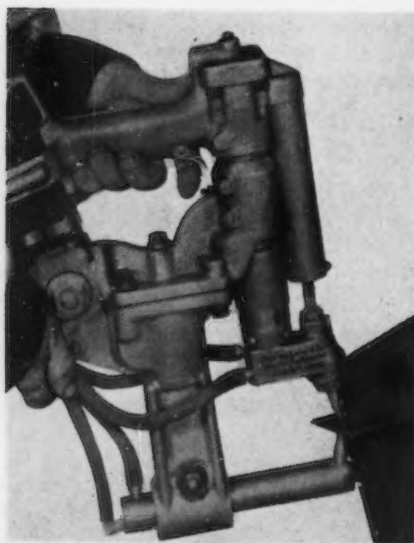
Cooling of the gun is by means of two water circuits, one connected to the sliding contact head, the other to the lower electrode. The gun is avail-

able in C-type, scissors, yoke and a variety of special types to fit all pinch type spot welding requirements.

TO compete directly with cable type gun welders and particularly adapted for small jobbing shops where first cost is an important factor and where power supply is limited, a portable, hanging type of spot welding machine has been brought out by the *Electric Arc Cutting & Welding Co.*, 152 Jelliff Avenue, Newark, N. J. Welding head, control and automatic switch are arranged in one compact unit which can be hung from a trolley

or portable crane so as to spot weld work supported on a form or jig. Power demand ranges between 5 and 10 hp. and the electrical connections are light, no heavy, water cooled cables being required.

A CONVERTIBLE spot welder especially designed for welding aluminum, dural and stainless steel has been installed recently at the plant of the *Ryan Aeronautical Co.*, San Diego. It was designed and built by Ralph S. Thacker, now head of the resistance welding division of the *Harvey Machine Co.*, Los Angeles. The water cooled electrode holders are removable and may be clamped either in a vertical position or on a 22½-deg. angle on the tubular arms. Provision is made at the rear of the upper arm for mounting a variable speed d.c. motor geared to a roll wheel



ABOVE

WHERE the cable type of gun welder is not applicable because of cost or insufficient power supply, *Electric Arc Cutting & Welding Co.* is offering this portable spot welder with built-in transformer and chain suspension.

• • •

AT LEFT

WELDING current is transmitted through the hydraulic pressure cylinder itself in the loaded and cocked position in this light weight *Progressive* pincher type welding gun, made almost entirely of magnesium castings.

ABOVE

THE jaws of this *Progressive* welding point puller are slipped over the electrode and are locked in place by a slight lift of the handle. A tap of a hammer on the bottom of the puller is then sufficient to remove the electrode from the holder. A straight line pulling action is said to be assured, even if the tool is inserted at an angle. Slipping and consequent scoring of the electrode are said to be avoided.

• • •

# AND ARC WELDING APPARATUS . . .

drive shaft extending through the arm. A set of rolls then replaces the electrode holding clamps, converting the machine into a continuous seam welder. Pressure is applied to electrodes by a pneumatic cylinder at the rear of the upper arm, a regulator providing a range up to 1500 lb.

All controls of the timing, heat and sequence are carried to the front panel, together with the air and water valves and regulators. General Electric Ignitron control is employed. Provisions are made for operating the machine on single spots or on repeat spots with a variable delay between cycles, the position of the sequence switch being shown by indicating lamps.

**S**EVERAL other contributions to the resistance welding art also have been made by *Progressive Welder Co.* One is a simple taper point

By **FRANK J. OLIVER**  
*Associate Editor, The Iron Age*

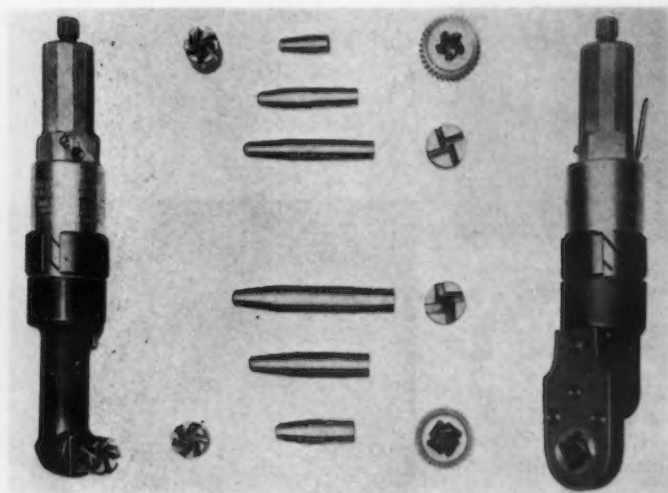
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puller for Hydromatic and multiple spot welders. The other is a line of air operated welding point dressers designed for reshaping the points without removing them from the machine. The cutter is merely held against the tip, a trigger on the dresser is pressed and is released as soon as the free running of the hollow milling cutter tells the operator that the point has been reshaped. Interchangeable blades are used to take care of varying shapes of electrodes.

## Resistance Welding Timers

**A**CCURATE timing of welds made by spot, butt and projection welding machines is provided by the

new EC&M Neutron weld timer, recently announced by the *Electric Controller & Mfg. Co.*, 2700 East 79th Street, Cleveland. This compact device operates on the principle of the time required to charge a condenser to a predetermined voltage. When this voltage is reached, the condenser is discharged through a neon tube to open the magnetic contactor handling the main power circuit to the welding machine. The standard form 60 unit has a time range of  $\frac{1}{2}$  to 60 cycles, by means of two selector dials; for longer time requirements, the form 120 Neutron gives a range of 1 to 120 cycles (2 sec.). In the standard form, the controller is for use with manual, motor operated or air operated welders. The automatic, non-repeat form, with non-beat and hold features is available for operation on air operated ma-



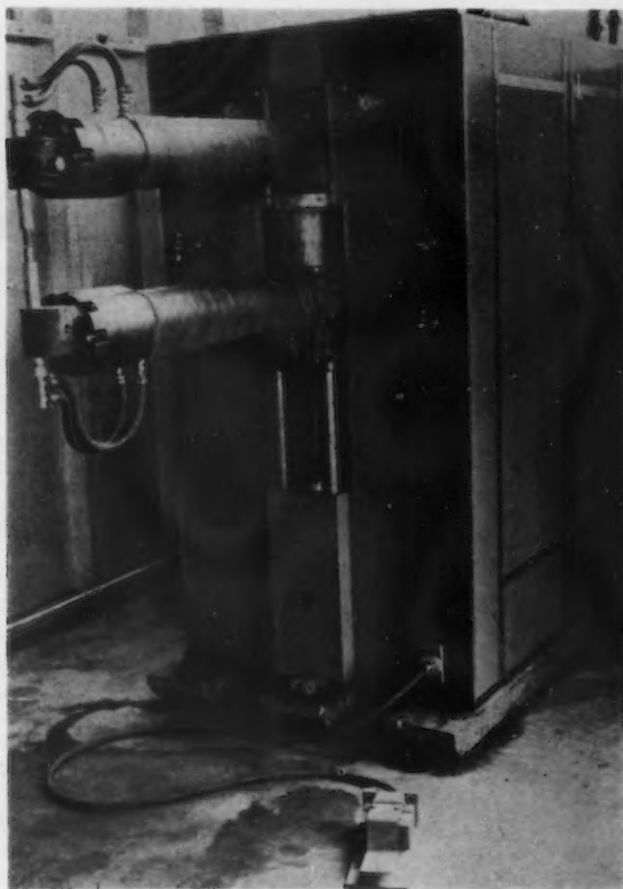
ABOVE

**P**ROGRESSIVE welding point dressers. Type A dresser at right is a flat plate design for minimum clearance between points in multiple spot welders. Type B, left, is a shank type requiring more clearance but costing slightly less. A wide range of cutter shapes are available for either dresser.

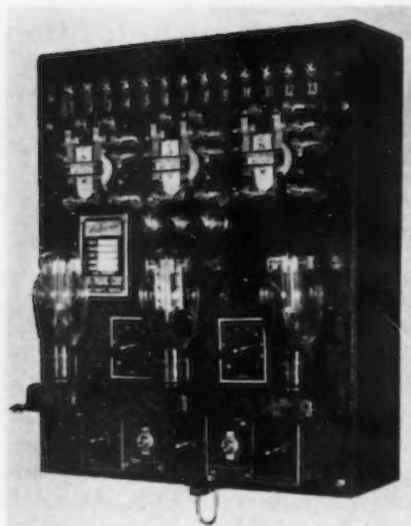
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AT RIGHT

**N**EWLY designed spot welder in the Ryan Aeronautical Co. factory for welding aluminum, dural and stainless steel. The unit may be readily converted into a seam welder.







**S**TANDARD relays and electronic tubes are used in the line of electric welding timers recently announced by the Electronic Corp., Detroit. Welding current may be adjusted from one to 40 cycles, and many other phases of the welding cycle may be controlled from this panel.

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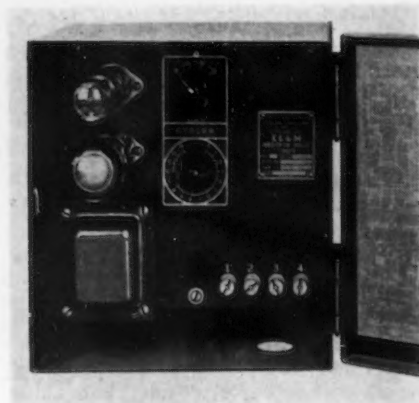
chines. This timer is also available in an automatic repeat type.

**A**NOTHER timer for similar application but employing standard relays and electronic tubes is that announced by the *Electronic Corp.*, Detroit, after a year of experimental use. Up to 600 spot welds per min. have been made with these timers. Welding time may be adjusted from 1 to 40 cycles, and the device may be set to interrupt the welding current a number of times during the welding operation. This feature enables sections up to  $\frac{1}{2}$  in. in thickness each to be welded with modern hydraulic spot welding equipment. The length of time the electrodes remain in contact with the work after the current has been cut off can also be controlled as well as the regulation of start of welding current, including time delay before welding current goes on after the electrode pressure has been established. For automatic spot welding, the timer will open and close the electrode at periodic intervals, permitting the carrying out of multiple welding operations merely by closing a pilot switch. The timers are available in standard voltages and frequencies.

#### Arc Welders

**S**ELF-INDICATING dual continuous current control, recently introduced in larger machines, is also being featured in a small arc welder,

known as the SA-150, made by the *Lincoln Electric Co.*, Cleveland. The welder's current range of 45 to 200 amp. suits it for sheet metal work, hard facing, fit-up and auxiliary work and general production welding. Both voltage control and current control are continuous in operation, providing variations in both the slope of the volt-ampere curve and the amount of



**V**ARIATIONS in weld timing between  $\frac{1}{2}$  and 60 cycles in  $\frac{1}{2}$ -cycle steps can be obtained with the EC&M Neutron weld timer for spot, butt and projection welding.



**P&H-HANSEN W-200 square frame welder** has a welding current range from 40 to 225 amp.

o o o

the welding current to suit every job encountered. The machine is equipped with dials that indicate the type of work and corresponding amperes for each and every setting of the job selector (voltage control).

The SA-150 is powered with a Lincoln Weld squirrel cage induction motor for across-the-line starting, vertically mounted. Construction is of arc-welded steel. Connections are readily accessible for either 220 or 440 volts, three or two phase, 60 or 50 cycles.

**H**ARNISCHFEGER CORP., Milwaukee, has developed a square frame welder for multi-arc service,

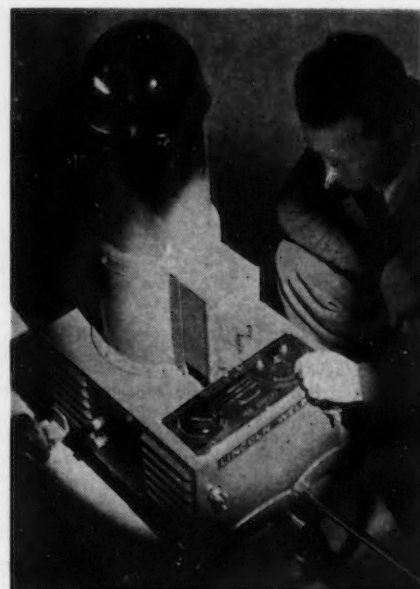
called the model WA-200. Requiring less than  $3\frac{1}{2}$  sq. ft. of floor space, this new welder offers a welding range from 40 to 225 amp. and has but two major parts, the one-piece frame and the rotating member itself. The characteristics made possible by the Hansen patents, namely automatic volt-ampere regulation, self-excitation and internal stabilization of welding current are retained, but attachments such as external exciters, reactors, resistors, rheostats or separate stabilizers are absent. The rotating member is balanced statically and dynamically. Where a wider welding range is desired, these units may be hooked in parallel without special adjustments to gain any welding amperage.

#### Combination Electric and Gas Welding Trailer

**C**OMPLETE gas welding and cutting equipment, manufactured by the *Young Sales Co., Inc.*, Milwaukee, has been added to a standard P&H Hansen electric welding trailer unit made by the *Harnischfeger Corp.* and is being marketed by the Young concern. The electric unit consists of a Hansen 150-amp. generator coupled to a Wisconsin air cooled motor. Gas equipment includes torches, regulators, gas cylinders and associated equipment.

#### Stainless Steel Welding Electrodes

**S**TAINWELD C is a new type of stainless steel welding electrode recently developed by the *Lincoln*



**S**MALL motor-generator type arc welder, announced by the *Lincoln Electric Co.*, with self-indicating dual continuous control of voltage and current.

*Electric Co., Cleveland.* It is of the 18-8 type with 3½ per cent molybdenum for welding steel of that analysis, commonly used in bleaching and dyeing apparatus and in the pulp and paper industry for piping and tanks. The electrodes are coated and are said to produce welds of high strength and ductility, with corrosion resistant properties similar to the parent metal. The electrode is made in three sizes of 1/8, 5/32 and 3/16 in. and in 11½ in. lengths.

**A** COMPLETE line of stainless steel electrodes covering all analyses is being offered by the *McKay Co., Pittsburgh.* Each package contains a certification of weld deposit analysis rather than the wire analysis. Among the claims made for these electrodes are: Instant contact upon restriking arc; ease of slag removal; spatter free within practical limits; smooth bead with perfect weld contour, and uniform, high quality weld deposits. All alloys are contained in the core wire.

#### Electrode for A.C. Transformers

**A** LOW carbon steel rod with a heavy extruded shielded arc coating, known as Readyweld, has also been developed by the *Lincoln Electric Co.* for use with low voltage transformer type welders. The coating assures arc stability and easy restriking of the arc. The electrode is intended for general welding and repair work on light gage sheet metal and is said to provide a weld of high strength and ductility. It can be used with d.c. negative plants, as well as a.c. transformer welders. It is manufactured in 3/32 in. diameter and 12 in. lengths for current range from 25 to 85 amp.

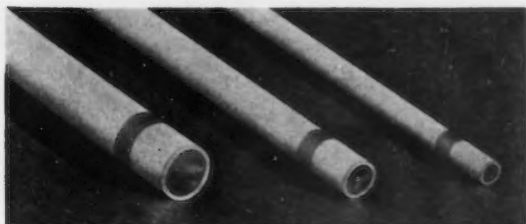
#### Hard Surfacing Material

**S**URFACEWELD A is a fine grained alloyed powder to be applied with the carbon arc to give a

o o o

#### BELOW

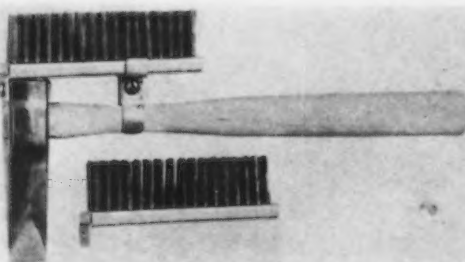
**C**IG coated bronze welding rods are said to have many advantages over non-coated rods or powder type fluxes for all types of gas brazing operations.



**F**OR smithing operations, such as forging, forming, straightening, bending and pressing, *Linde Air Products Co.* is offering the type W-26 heavy duty welding blowpipe which delivers a large amount of heat to a localized area by means of an oxy-acetylene flame. Extensions for the welding head are available for extra heavy work, doing away with the necessity for heat shields. Its applications cover the fabrication of tanks and pressure vessels, the making of locomotive boilers, for straightening and bending ship plate and wrinkle bending large diameter pipe. It can also be used for certain flame hardening operations.



**S**EVERAL more types of anti-spatter compounds have recently appeared on the market. This typical photograph shows the effect of Spatter-Nox in preventing adherence of weld spatter. It also acts as a rust inhibitor.



**T**RIPLEX welders' chipper, made by *St. Pierre Chain Corp., Worcester.* It consists of a drop forged steel chipping hammer with a heavy duty wire brush rigidly mounted on the top side. The chipper is designed especially for the quick removal of slags formed on top of weld metal when heavily coated electrodes are used and for prior descaling operations. Brush may be reversed, end for end, to act full wear and is replaceable.

o o o

#### AT RIGHT

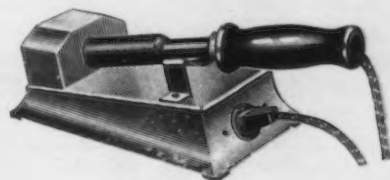
**T**HE thermostatic control stand for controlling the heat of electric soldering irons when not in use, introduced by the *Electric Soldering Iron Co., Inc., Deep River, Conn.,* a year ago, can now be used either on a.c. or d.c. circuits. This stand cuts the iron in and out of the circuit at any selected temperature for the work in hand, and prevents burning off of the tin or the point itself.

smooth, dense, hard, abrasion resistant surface. When properly applied, the coating will have a hardness of about Rockwell 54C, depending somewhat upon the amount of admixture with the base metal. It maintains its hardness at high temperature and resists scaling at high temperature. The deposit cannot be softened by annealing. Corrosion resistance compares favorably with that of stainless steel. One of its advantages is that it can be applied in very thin and smooth layers. A deposit as thin as 0.025 in., for example, can be applied to 12 to 20 gage sheet metal. This is another product of the *Lincoln Electric Co.*

#### Coated Bronze Welding Rod

**T**WO new bronze welding rods for the oxy-acetylene welder have been announced by *Compressed Industrial Gases, Inc., Chicago.* These Ready-Fluxed bronze and manganese bronze rods, designated as CIG No. 400 and 401 respectively, are flux coated throughout their length, controlling the even introduction of the chemically correct flux throughout the brazing operation. The flux completely shields the molten metal and prevents the weld from getting too much or too little bronze. These bronzes are doubly deoxidized so that welds made with them are practically fumeless. The flux is said also to keep the molten metal in a semi-plastic condition, enabling the operator to apply the bronze in any position with ease. The No. 401 rods are particularly recommended by the maker for the brazing of cast iron. Results much superior to those obtained with

(CONCLUDED ON PAGE 113)



# Current Metal Working Activity

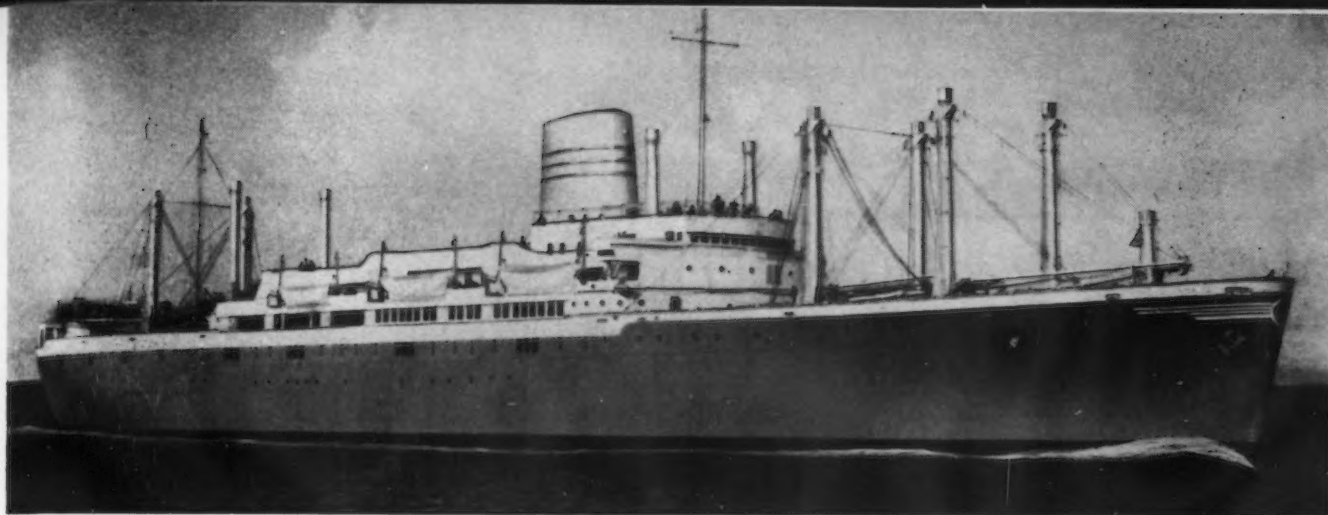
Latest Data Assembled by THE IRON AGE from Recognized Sources

	May 1939	April 1939	May 1938	Five Months 1939	Five Months 1938
<b>Steel Ingots: (gross tons)</b>					
Monthly output <sup>a</sup>	2,917,876	2,986,985	1,800,877	15,499,546	9,155,740
Average weekly output <sup>a</sup>	658,663	696,267	406,519	718,236	424,270
Per cent of capacity <sup>a</sup>	48.24	50.99	30.30	52.60	31.07
<b>Pig Iron: (gross tons)</b>					
Monthly output <sup>b</sup>	1,717,516	2,056,177	1,255,024	10,403,918	6,811,005
<b>Raw Materials:</b>					
Coke output <sup>c</sup> (net tons)	2,421,235	2,934,560	2,339,321	15,456,042	13,091,316
Lake Ore consumed <sup>d</sup> (gross tons)	2,245,513	2,799,769	1,711,146	14,141,219	9,244,627
<b>Castings: (net tons)</b>					
Malleable, orders <sup>e</sup>	27,702	29,183	17,564	164,221	94,477
Steel, orders <sup>e</sup>		34,100	20,636		130,651
<b>Finished Steel: (net tons)</b>					
Trackwork shipments <sup>a</sup>	6,658	6,819	2,959	27,117	18,080
Fabricated shape orders <sup>f</sup>	156,207	117,549	77,322	553,252	390,201
Fabricated plate orders <sup>e</sup>	34,036	35,844	25,141	143,078	126,400
U. S. Steel Corp. shipments <sup>g</sup>	723,165	701,459	465,081	3,659,833	2,532,297
<b>Fabricated Products:</b>					
Automobile production <sup>h</sup>	296,000*	359,200*	210,174	1,678,927*	1,116,633
Steel furniture orders <sup>e</sup>	\$1,780,024	\$1,619,218	\$1,290,469		\$8,199,113
Steel boiler orders <sup>e</sup> (sq. ft.)	877,117	764,996	733,678	4,206,754	2,884,516
Locomotives ordered <sup>i</sup>	51	19	5	144	44
Freight cars ordered <sup>i</sup>	2,051	2,695	6,114	7,753	6,933
Machine tool index <sup>j</sup>	219.8	155.6	66.7	186.9†	88.0†
Foundry equipment index <sup>k</sup>	108.8	146.0	90.6	133.9†	94.9†
<b>Non-Ferrous Metals: (net tons, U. S. only)</b>					
Lead shipments <sup>l</sup>	40,124	37,903	25,098	193,508	147,160
Lead stocks <sup>l</sup>	129,270	123,394	164,636		
Zinc shipments <sup>m</sup>	39,354	40,641	24,628	208,006	125,990
Zinc stocks <sup>m</sup>	126,769	130,380	148,120		
Tin deliveries <sup>n</sup> (gross tons)	5,905	5,980	4,275	25,075	22,545
Refined copper deliveries <sup>n</sup>	58,630	46,667	33,154	266,726	183,588
Refined copper stocks <sup>n</sup>	342,419	332,513	369,809		
<b>Exports: (gross tons)</b>					
Total iron and steel <sup>o</sup>		394,008	540,639		2,603,658
All rolled and finished steel <sup>o</sup>		134,478	109,459		617,168
Semi-finished steel <sup>o</sup>		8,849	17,596		132,510
Scrap <sup>o</sup>		237,691	371,745		1,624,795
<b>Imports: (gross tons)</b>					
Total iron and steel <sup>o</sup>		44,083	20,814		103,098
Pig iron <sup>o</sup>		3,512	1,795		19,465
All rolled and finished steel <sup>o</sup>		32,587	15,691		68,644
<b>British Production: (gross tons)</b>					
Pig iron <sup>q</sup>	692,100	608,900	633,900	2,921,000	3,463,900
Steel ingots <sup>q</sup>	1,218,100	1,058,200	957,000	5,230,000	5,149,800

† Three months' average. \* Preliminary.

Source of data: <sup>a</sup>American Iron and Steel Institute; <sup>b</sup>THE IRON AGE; <sup>c</sup>Bureau of Mines; <sup>d</sup>Lake Superior Iron Ore Association; <sup>e</sup>Bureau of the Census; <sup>f</sup>American Institute of Steel Construction; <sup>g</sup>United States Steel Corp.; <sup>h</sup>Preliminary figures from Ward's Automotive Reports—Final figures from Bureau of the Census, U. S. and Canada; <sup>i</sup>Railway Age; <sup>j</sup>National Machine Tool Builders Association; <sup>k</sup>Foundry Equipment Manufacturers Association; <sup>l</sup>American Bureau of Metal Statistics; <sup>m</sup>American Zinc Institute; <sup>n</sup>New York Commodity Exchange; <sup>o</sup>Copper Institute; <sup>p</sup>Department of Commerce; <sup>q</sup>British Iron and Steel Federation.





ABOVE

**S. S. PANAMA**, the first all fireproof ship to be built according to new specifications adopted by the Bureau of Marine Inspection and Navigation following the Marro Castle and Mohawk disasters. It will be followed in service by two sister ships. These new 10,000-ton passenger-cargo vessels are 493 ft. in length, 64 ft. in beam. For the hull, blue-gray is used with green boot-topping and the smokestack is buff, accented with three horizontal aluminum bands.



AT LEFT

**THIS** view of the main hall of the S.S. Panama reflects the modern styling of the three new New York-Panama ships. Fireproof construction is obtained by extensive use of metals, glass, plastics and other non-combustible materials in furniture as well as in walls, ceilings, floors and other structural parts.

## Metals Used Extensively in Interior of New Ships

**FIREPROOF** construction, obtained by extensive use of steel, aluminum, glass, synthetic plastics and other non-combustible materials, feature the interiors of the S. S. Panama here pictured, one of a trio of vessels built in the Fore River Shipyards of the Bethlehem Steel Co., for the New York-Panama service of the Panama Railroad Steamship Co.

In the club rooms, for example, doors are of stainless steel; tables combine tops of plastic with aluminum; glass is used functionally as well as decoratively. All the furniture in staterooms and public spaces is fireproof and of special design. Upholstered pieces make use of sponge rubber that has been fireproofed. Specifications called for steel and other non-combustible materials in the walls, ceilings, floors and other structural parts of these vessels.

In addition to the extensive fire-

proofing, these ships, regarded as the "safest in the world," feature subdivision of the hull into 12 separate compartments, any three of which may be pierced simultaneously without affecting the vessel's ability to stay afloat.

The ship pictured, the Panama, sailed on its maiden voyage to the Canal Zone on April 27. She will be followed in service on July 6 by the Ancon and later by the Cristobal, sister vessels.

These three 10,000-ton passenger-cargo vessels were designed by George Sharp, naval architect, and Raymond Loewy, industrial designer. Accommodations are provided for 206 first-class passengers in 70 staterooms, each with a private shower or bath. On "A" deck, on which the greatest number of staterooms are located, there are eight verandas around which a series of staterooms are grouped so that any inside room will have a view of the

sea. Public rooms include a large air conditioned dining room, a spacious hall, lounge, clubroom and a children's playroom.

In addition to planning the interiors of the three new ships, Mr. Loewy collaborated in the styling of exterior features, including the smoke stack. The interior design is a departure from traditional lines or periods. It is simple and restrained modern style and is similar to his work in the railroad, aviation and automotive fields. Throughout the ships the basic structural scheme has been utilized as part of the decorative treatment. Special attention has been paid to illumination. In some cases it becomes part of the ship's architecture and troughs of indirect light, brilliant coves and spotlighted effects are found. Fixtures are of simple design and materials such as aluminum, in satin and polished finishes, have been used with glass and plastics.

# THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN  
Detroit Editor

*... Ford light-weight tractor and implements demonstrated at Dearborn ... Agricultural equipment industry ready for new era ... Auto production starts seasonal slide, dropping to 70,663 ... GM tool and die strike threat seen as step to union job shop agreements.*

**D**ETROIT — Henry Ford, successful student when it comes to determining what mankind needs and will buy, last week revealed the product with which he hopes to revolutionize agriculture "and," he says, "industry, too."

Observed by nearly 450 representatives of publications, many of them

from the farm journals, and from 30 states and 18 foreign countries, the new Ford tractor and unit implement was put through an impressive demonstration at the Ford estate in Dearborn on a plot of farm land within sight of the Ford Engineering Laboratories and the Rouge plant. Harry Ferguson of Belfast, Ireland, who stirred Henry

Ford's interest with an idea which originated 20 years ago, put the tractor and its special implements through their paces, and did most of the talking at the demonstration and the luncheon preceding at Dearborn Inn.

The tractor is a four-cylinder machine made unusually light to avoid packing the ground and for economical operation. Conventional in appearance, its most important features are the method of attaching and towing the implements, the light weight of the entire assembly, field performance and economy, and an overall delivered price said to be much lower than the price of any comparably powered farm equipment.

Ford's and Ferguson's joint attempt to aid the farmer is based on the broad assumption that farm mechanization is essential to the "profitable and interesting" conduct of agriculture. The Ferguson-designed plows and cultivators are attached through a sort of parallelogram linkage which prevents upsetting and permits safe operation under all conditions.

In operation, when the implement hits a stump or similar obstruction, the linkage transfers the load to the tractor in such a way that a positive couple of forces acts to push the front wheels against the ground and lift the rear wheels so they spin freely. With no more driving force left, the tractor cannot turn itself over. Without doubt, this is one of the most important, though a simple innovation. Farmer and industrialist alike have seen tractors "rear and buck," sometimes dangerously. Besides eliminating this risk with the new linkage, Ferguson has greatly facilitated operations through the use of hydraulic controls to lift and lower the implement and adjust it for depth of operation. The unit for this is a four-cylinder hydraulic pump.

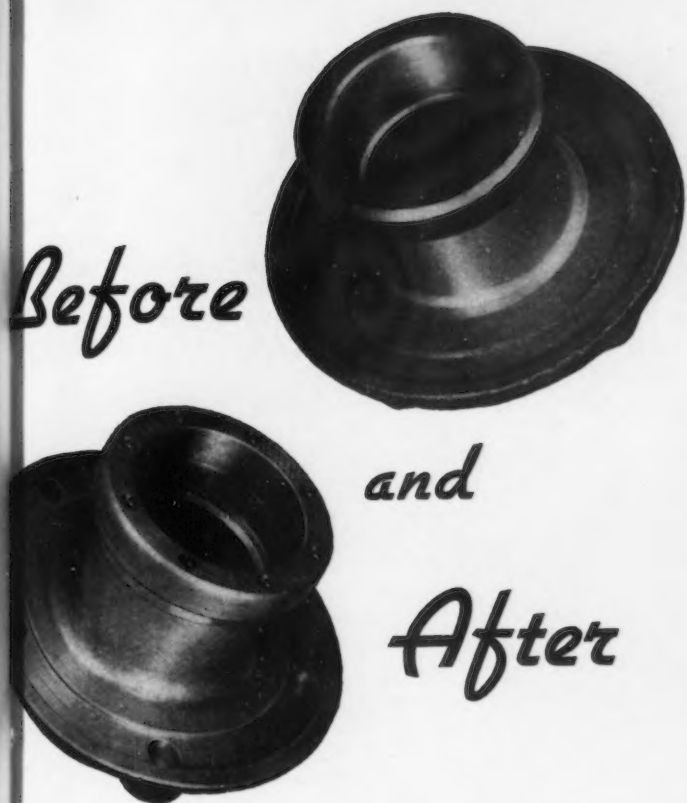
## Light Alloys Used

Light weight (the entire assembly is about 1750 lbs. compared with sometimes 4000 or more for tractors and



**T**HE new light-weight, low-cost farm tractor which was demonstrated last week at Henry Ford's farm near Ford Motor Co.'s plant is expected to revolutionize farm work and farm machinery manufacture.

# TYPICAL MULT-AU-MATIC *Experience*

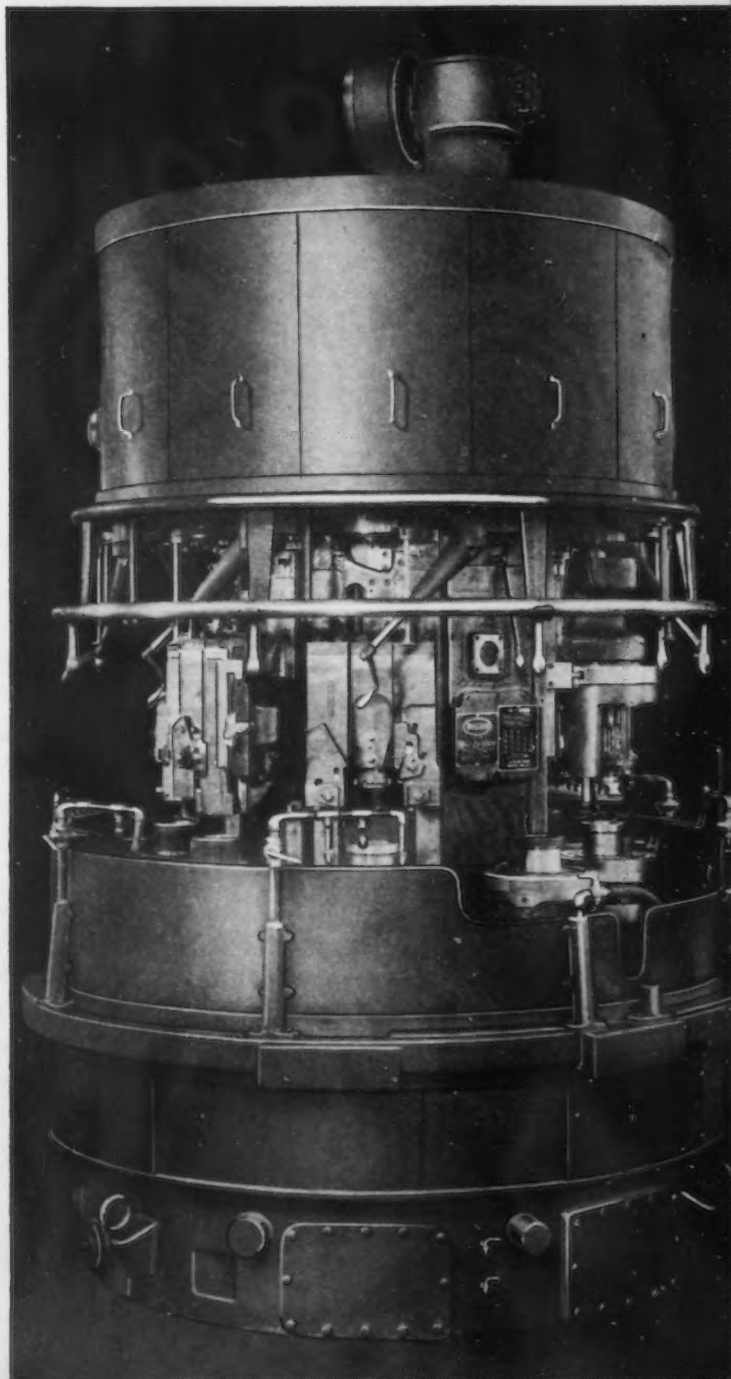


Two chuckings and a rough piece of metal become a finished wheel hub in time that seems unbelievable.

Look at the photos above. Right—the rough forging at the end of the first chucking. Left—the finished job; turned, faced, bored, reamed, 5 holes drilled in the flange, 8 in the hub—all done in the time needed for the longest single operation, plus a few seconds for indexing.

Machining operations of this sort are possible when the Bullard Mult-Au-Matic Method is utilized—individual speeds, individual feeds, simultaneous operation.

Is your file of information on Bullard Mult-Au-Matics up to date?



**THE BULLARD COMPANY**  
BRIDGEPORT, CONNECTICUT

**BULLARD**



implements of similar capacity) has been attained through design skill and the use of alloys. For example, not generally revealed yet is the fact that the entire hood over the engine and the radiator shell and grille unit, and even most of the instrument panel, are magnesium alloy castings, which are far lighter than aluminum. Another unusual application of this new material is the control quadrant at the right of the driver's seat. Front axles, which are "I" sections, are a cast steel, said by Ferguson to have been developed by Charles E. Sorenson, of Ford Motor Co. It is said that Ford intends to continue the application of available alloys to reduce weight and increase strength.

Performance was admittedly outstanding. Although many at the demonstration did not claim farm experience, anyone acquainted with vehicle performance was impressed with the ability of the tractor to absorb load as implements dug in. The engine, despite its reasonably small size (23 hp. at 1400 r.p.m.), would absorb such load even while operating at idling speed,

without even "grunting," as one spectator said.

Revelation of the price of this tractor at \$585, delivered at Detroit, disappointed many who had believed rumors that the price would be \$395 or thereabouts. However, examination of competitive equipment with similar capacity reveals that the Ford price actually is in the low brackets. For instance, in the nearby state of Ohio, the Ford tractor will deliver for \$610. This price includes rubber tires and self-starter and a power take-off unit which is standard equipment. Key implements, such as the 14-in. two-bottom plow and the cultivator will be approximately \$85 apiece. So, for less than \$800, the farmer gets a rather complete set-up and he can tow other conventional farm implements and wagons with the new tractor. The average price for a similar tractor which will pull a double-bottom 14-in. plow is around \$1000. This, however, is a three-wheel tractor, and there is an extra charge for conversion to a four-wheel tractor. Plows cost about \$185, and cultivator about \$120 extra. Self-starters are not standard, usually

costing about \$100. Other extras bring the price up to about \$1450, delivered.

Of course, there are several other tractors that sell in the low price range, but farmers declare that the price is about like the f.o.b. price of an automobile here in Detroit. The low prices generally only include steel stud wheels, no starter, and no power take-off; and the lighter tractors will pull only one plow.

One source familiar with the Ford set-up and close to the Ferguson-Sherman Mfg. Corp., which will handle merchandising of the equipment, declares that a lower price was contemplated, but many of the distributors insisted that the price be kept up in anticipation of price changes which might develop in the tractor and implement field after Ford got underway.

#### Ford Dealers to Handle It

Sale of the tractor will be handled by Ford dealers if they care to add this line and are in a position to handle it. After they have had a chance to express their choice, other dealers will be added to the list. One distributor declared that in the two nearby states which constitute his territory he has 170 bona fide orders. He has signed 80 dealers, and declares that, if he could get the tractors, he could deliver 700 immediately. Financing will be handled at a specially low rate for this farm equipment.

If the tractor is the success anticipated by Mr. Ford—and if it results in complete mechanization of American farms and the elimination of more than 16,000,000 horses and mules—the Ford-Ferguson combination is destined to become an important part of the Ford empire. Among the spectators at the field tests were many industrial representatives who sell materials, machines and parts to Ford. Their interest in the proceedings had been whetted by knowledge of recent events in the agricultural implement industry. Admitting that much fine equipment is made for the farmer today, they point back to the serious error of some years ago when farm equipment in general was regarded by the farmer as pretty expensive to own and operate, largely because design and materials fell short of the operator's need. They recall, for instance, that iron parts seldom were made of malleable castings which could withstand everyday punishment in the field. Then, a few years ago, a new line of greatly improved tractors made its appearance. Lighter in weight, better designed and more durable—and with an entirely new low scale of prices—these units

(CONCLUDED ON PAGE 80)

## THE BULL OF THE WOODS

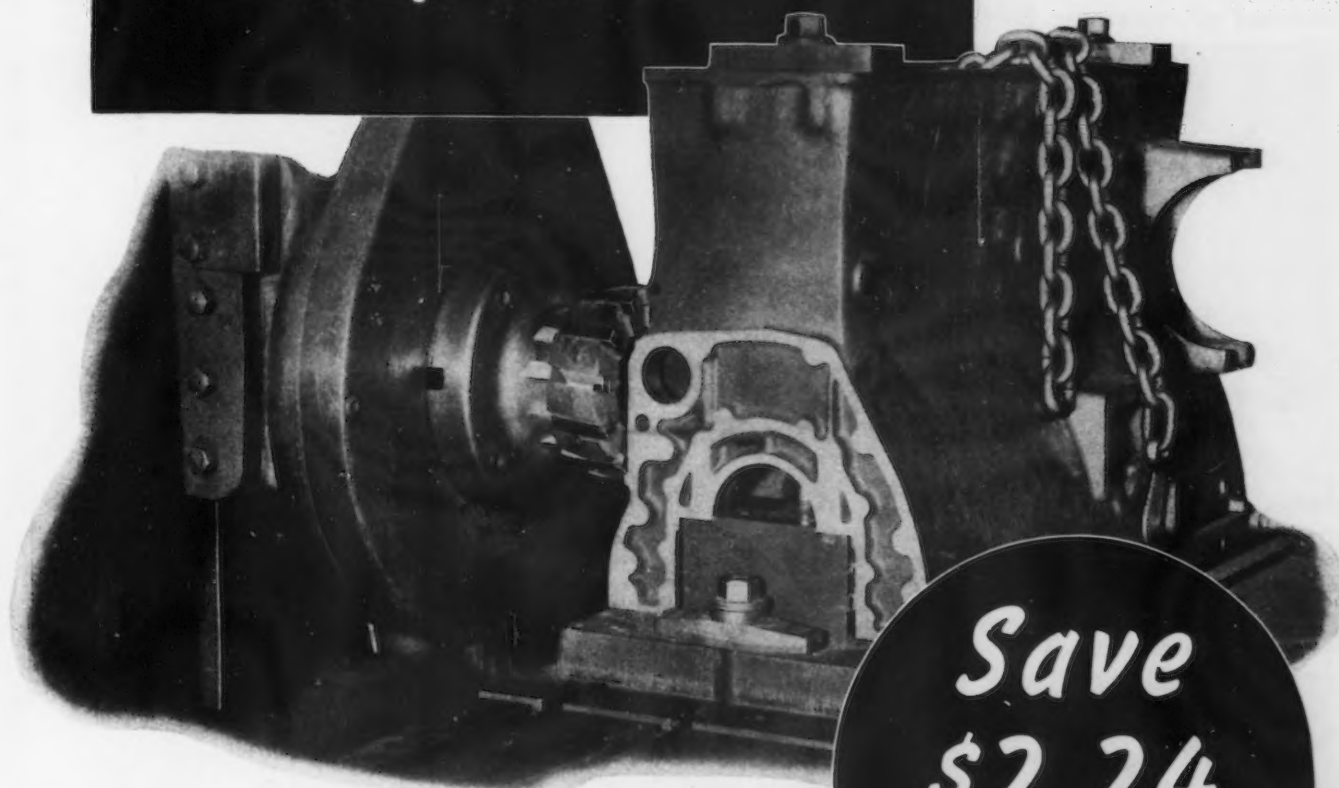
BY J. R. WILLIAMS



# "Hidden Profits"

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of this Diesel Engine Manufacturer



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MACHINED

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# CARBOLOY CEMENTED CARBIDE TOOLS



# THIS WEEK IN WASHINGTON

*... Automobile industry tells Senate committee that Wagner Act and its administration has created unrest and turmoil instead of reducing labor disputes . . . \$25,000,000 order for airplane engines awarded by War Department.*

By L. W. MOFFETT  
Washington Editor

WASHINGTON—More testimony that the Wagner Act inaugurated a period of agitation, unrest and turmoil in industry instead of reducing labor disputes, as was intended by its sponsors, was given to the Senate Education and Labor Committee last week by spokesman for the automobile industry.

William J. Cronin, secretary of the Automobile Manufacturers Association, who submitted for the record a 74-page booklet, replete with photographs showing strike damage, weapons used by strikers and evidence of sabotage, related to the committee how former convicts had participated in CIO unionization drives in the industry, how union representatives coerced workers to join up with them, and how they had intimidated civil authorities.

The witness described the sit-down strikes in Michigan and referred to the current factional split in the automobile unions, maintaining that the employees do not have a remedy for this situation under the Wagner Act. He proposed that the law be revised to include provisions insuring workers real freedom of choice in selecting or rejecting bargaining representatives without coercion or intimidation by anyone; insuring observance of agreements by all parties thereto, subject to equal penalties for violation; and insuring that strikes and other stoppages of production shall represent the will of at least a majority of the employees and not the ill-considered action of a few.

Going into detail on troubles encountered from time to time by individual members, Mr. Cronin said that the present intra-union split in the industry, involving millions of dollars, power and prestige, threatens to be a bitter one.

"Plant managements," he said, "have made every effort to maintain a position of strict neutrality. They do not know whom to recognize either as representatives of the national organization or of its plant locals. In the case of divided local unions managements have declined to deal with representatives of either faction, except in the presence of representatives of the other.

"Where that opportunity has been rejected, or has proved impractical in operation because of the hostility of the factions toward each other, adjustment of grievances and negotiations have necessarily returned to an individual basis temporarily," Mr. Cronin said. "Outbreaks of factional bitterness have caused serious disturbances in some plants, and the outlook is difficult to appraise."

Confronted with this situation, the manufacturer finds himself without a remedy, Mr. Cronin emphasized to the committee, explaining that unless one faction chooses to appeal to the NLRB and unless both are content to abide by the result of intervention, the manufacturer "will find himself ground between the millstones of union factionalism with the worker, the consumer, and the community ultimately bearing the consequences."

The witness laid emphasis on the industry's record for liberal treatment of labor, recalling that during the industry's period of expansion workers were generally unorganized, yet for many years average wages were the highest for any major industry and hours and other working conditions in modern, up-to-date plants compared favorably with, if they did not surpass, those to be found in any industry.

As a result, he continued, during this entire period of extraordinary expansion covering nearly 40 years, the industry was remarkably free from labor trouble, having experienced almost no strikes or other interruptions in production until quite recently. At this point Mr. Cronin traced the history of collective bargaining legislation from the advent of the NRA up to the present time.

Turning to the subject of sit-down strikes, he told the committee that certain features were characteristic of all these incidents. First, he said, they followed closely the pattern established by syndicalists in France during the summer of 1936; they were not spontaneous but obviously according to carefully prearranged plans; they were participated in by small minorities of the employees when the union had consistently refused to offer evidence that it represented more than a minority; each was carefully organized with a small group of leaders taking charge as soon as a signal for the sit-down was given.

In most cases involving the sit-down, a considerable number of employees were trapped in the buildings and forced to participate against their will but some of these later escaped at night or by various devices, he related. Sleeping and cooking equipment was rushed into plants from previously prepared stores, contempt was displayed for law enforcement authorities and elaborate preparations made for resistance, including construction of barricades, and the manufacture of weapons. If attempts were made to eject strikers, threats were made to destroy plants, machinery and materials. In short, he continued, a more



# *There's a right G-E MAZDA lamp for every industrial lighting purpose*

General Electric makes a lamp to meet every industrial lighting need. A few of them are shown here. G-E MAZDA lamps represent the result of more than 40 years of research and development. Each of them must pass 480 tests, checks, and inspections in manufacture

to guard against imperfections that might affect their performance in service. For detailed information about G-E MAZDA lamps and their adaptability for your lighting needs, we suggest that you write to the General Electric Co., Dept. 166-IA-G, Nela Park, Cleveland, O.



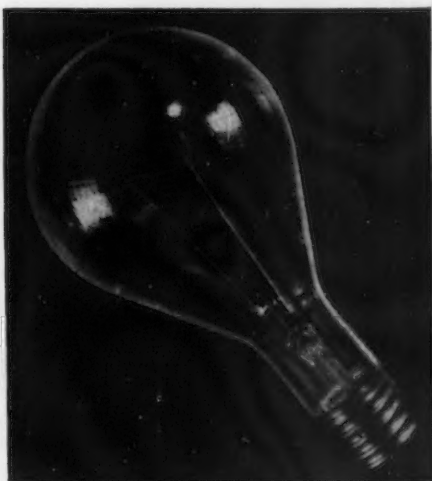
**G-E FLUORESCENT MAZDA** lamps provide economical light and are 50% cooler than incandescent lamps of same light output. The daylight lamp provides a close approach to real daylight. They are available in 18, 24, 36, and 48-inch lengths.



**G-E MAZDA PROJECTOR** lamps combine reflector, lens, and 150-watt filament in one sealed-in unit, protected from dust, moisture, and deterioration. Both Spotlight and Floodlight types are made of heat-resisting glass, permitting outdoor use.



**G-E SILVERED BOWL MAZDA** lamps are standard incandescent MAZDA lamps with a coating of "mirror" silver on the bowl. They are applicable to all types of indirect equipment and direct lighting reflectors—Available in 60 to 500 watt sizes.



**GENERAL LIGHTING SERVICE** lamps fulfill most of the lamp requirements for ordinary industrial use. Manufactured in sizes from 15 up to 1500 watts and available in certain sizes in clear, inside frosted, white bowl, and daylight bulbs.



**MERCURY LAMP** (400 watt size shown). Although differing radically in principle from incandescent lamps both in operation and color quality of light, mercury lamps have a wide range of industrial use . . . often combined with regular incandescent lamps.



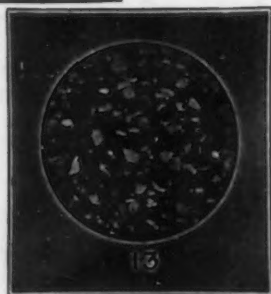
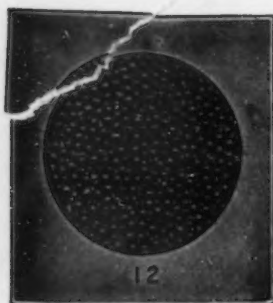
**VIBRATION AND ROUGH SERVICE** Lamps. The Vibration service lamp (shown above) is made to withstand high-frequency vibration such as produced by high-speed machinery. Rough service lamps are made to withstand severe shock and bumps.

## **G-E MAZDA LAMPS**

### **GENERAL ELECTRIC**

GENERAL ELECTRIC COMPANY, DEPARTMENT 166-IA-G, NELA PARK, CLEVELAND, OHIO

THE IRON AGE, July 6, 1939—71



## DOLLARS Saved Daily

Since the introduction of our  
Heat-Treated Steel Shot  
And  
Heat-Treated Steel Grit

### Consumers are saving

10 per cent  
15 per cent  
25 per cent

Metal blasting faster.

Metal blasting cheaper.

Metal blasting with a better finish  
than ever before.

Our large, modern plant produces only heat-treated abrasives—uniform quality the year round.

A month's run of our shot or grit in your machine will prove the above statements.

Send us samples of the sizes you use; test our product in your own machine and save money.

A ton or a carload.

# HARRISON ABRASIVE

Corporation

MANCHESTER, NEW HAMPSHIRE

**We Never Compromise With Quality**

or less complete breakdown of law and order occurred, with armed thugs patrolling highways, stopping cars, and searching occupants, as well as terrorizing the citizenry.

### Loss to Workers Heavy

Mr. Cronin estimated that the aggregate loss to employees from the sit-down strikes in the plants of four companies amounted to about \$44,210,000 in wages, an average of more than \$200 for each employee affected. To these he added the industry's costs for damaged equipment, materials, and plants and losses due to suspended operations—costs which he did not attempt to estimate.

"Industrial peace will certainly continue remote so long as minorities or leaders, for their own purposes or aggrandizement, may call strikes without penalty or loss of status regardless of contract provisions or the wishes of a majority of the workers themselves," Mr. Cronin declared. "The realities of industrial relations today, and the practical application of the National Labor Relations Act and similar legislation, actually place such elements beyond all law or control."

### American Bridge Co. Gets Grand Coulee Dam Job

WASHINGTON—The Bureau of Reclamation has awarded a \$54,079 contract to the American Bridge Co., of Denver, for 844 tons of structural shapes, plates, rivets and bolts for the east power house of Grand Coulee Dam in the State of Washington.

The bureau also awarded a \$106,177 contract to the Worthington Pump & Machinery Corp., of Harrison, N. J., for three motor-driven pumping units to be installed on the Gila project in Yuma, Ariz.

### Railroad Equipment Exports Halted in 1938

WASHINGTON—Commerce Department figures show that the upward trend of railroad equipment exports since 1932 was halted in 1938 when sales abroad were valued at \$21,576,952 compared with \$25,375,514 in 1937. Smaller foreign sales of railroad track material was the major factor in reducing the value of the year's trade below that of 1937, the department said.

The report attributed the decreased exports of railroad track material to

the retarded construction programs in many Latin-American countries, where projects were either considerably curtailed or abandoned during the year for financial reasons. Nevertheless, the Latin-American region accounted for \$10,262,064 of the total value of railroad equipment exports during 1938.

Canadian purchases were valued at \$3,877,750, Mexico bought \$2,736,936 worth; Brazil, \$2,359,008; Kwantung, \$1,808,013; Chile, \$1,530,547; and China, \$1,346,812. Foreign sales of steam railroad locomotives valued at \$3,261,489 were in excess of those for any other year since 1929, the department reported. Assistance given to American exporters by the Export-Import Bank was cited as the reason for the increased exports of locomotives.

### Tractors Lead in Exports Of Farm Machinery

WASHINGTON—The Commerce Department's Machinery Division estimated last week that exports of farm implements and machinery during May reached a value of \$6,548,384, representing little change from May, 1938, when they were valued at \$6,545,386. Foreign shipments of most types continued at lower levels than a year ago, the department said, but the decreases were more than offset by larger consignments of wheel and fuel injection type tracklaying tractors.

Exports of tractors and parts were up 11 per cent to a value of \$4,814,843; while tillage implements dropped 8 per cent; harvesting machinery 17 per cent; and seed separators 30 per cent below the May, 1938, figures.

### Scrap Consumption in May Estimated at 2,263,289 Tons

CONSUMPTION of scrap iron and steel in May is estimated by the Institute of Scrap Iron and Steel, Inc., New York, at 2,263,289 gross tons. This is a slight reduction from 2,316,898 tons in April, but a sharp increase over the 1,387,420 tons of May, 1938.

In the first five months of 1939 domestic consumption of scrap has totaled 12,022,434 tons, according to the institute estimate, or 70.6 per cent over the corresponding period of 1938.

Meanwhile, scrap exports in the first five months of this year, at 1,390,064 tons, as compiled by the Department of Commerce, are off 15.1 per cent from the opening five months of 1938.

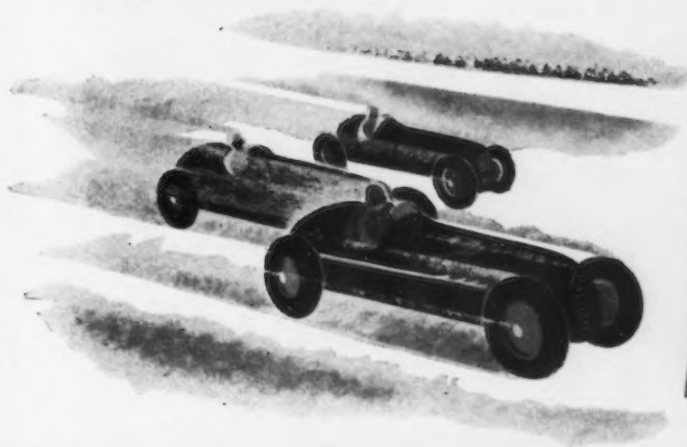
What a test for EVERLOCKS!  
They held my car together  
perfectly.

*Kilmer Shaw*



I used EVERLOCK washers  
exclusively. I depended on  
them to keep intact every nut  
and screw in my car. They did.

*Jimmy Snyder*



I played safe and used EVER-  
LOCK washers. They always  
hold.

*Cliff Bergene*



**Everlock**  
LOCK WASHERS

**THOMPSON-BREMER & CO.**

1640 W. HUBBARD ST. CHICAGO

**CHAMPIONS USE EVERLOCK WASHERS**





Greater Tonnage  
Per Edge of Blade

**A**

**AMERICAN**  
SHEAR KNIFE CO.  
HOMESTEAD - PENNSYLVANIA

## \$25,000,000 Contract For Airplane Engines Awarded by U. S. Army

WASHINGTON — Contracts totaling \$25,009,389.64 were awarded last week by the War Department for aircraft engines for the Army Air Corps expansion program. The award is believed by the War Department to be the largest of the kind it ever let since the World War.

The Allison Engineering Co., Speedway, Indianapolis, was awarded a \$15,080,261.83 contract for 1000-hp., 12-cylinder, liquid cooled engines for pursuit planes. An award of \$8,975,317 was given the Wright Aeronautical Corp., Paterson, N. J., for double row, radial, air-cooled engines for bomber planes which it is planned to procure from the Douglas Aircraft Co. The Pratt & Whitney Aircraft division of the United Aircraft Corp. was awarded a contract at \$953,810.81 for single row air-cooled engines of approximately 500-hp. for installation in combat planes which it is planned to procure from the North American Aviation Corp.

## Government Machinery Awards \$2,260,287; Iron and Steel, \$686,372

WASHINGTON — Government contracts for iron and steel products, as reported for the week ended June 24 by the Labor Department's Public Contracts Division, totaled \$686,372. For the same period, the division reported contracts for non-ferrous metals and alloys amounting to \$361,911 and for machinery, \$2,260,287. Details follow:

### Iron and Steel Products

National Tube Co., Christy Park Works, McKeesport, Pa., flasks, steel .....	\$59,580.60
Kinnear Mfg. Co., Inc., Columbus, Ohio, steel fire doors .....	14,976.00
U. S. Pipe & Foundry Co., Philadelphia and Burlington, N. J., cast iron water pipe .....	16,643.28
John Simmons Co., Newark, N. J., fabricated pipe .....	17,426.09
Columbia Steel Co., San Francisco and Torrance, Cal., sheet steel..	10,205.11
American Bridge Co., Pittsburgh, steel towers .....	48,921.75
American Bridge Co., Pittsburgh, steel towers .....	375,444.11
Remington Arms Co., Inc., Bridgeport, Conn., knife .....	12,750.00
Utica Drop Forge & Tool Corp., Utica and Yorkville, N. Y., pliers .....	20,700.00
Macwhyte Co., Kenosha, Wis., tie rods .....	13,909.40
John A. Roebling's Sons Co., Trenton, N. J., cable, steel .....	18,742.10
The B. F. Goodrich Co., Akron, tanks, steel .....	14,980.00

The Van Dorn Iron Works Co., Cleveland, prison cell work .....	13,200.00
Western Pipe & Steel Co. of California, Los Angeles, buoys .....	14,981.00
Biggs Boiler Works Co., Akron, buoys .....	34,013.00

### Non-Ferrous Metals and Alloys

Aluminum Co. of America, Pittsburgh and Massena, N. Y., electrical conductor .....	\$349,936.54
Chase Brass & Copper Co., Inc., Waterbury, Conn., cartridge brass disks .....	11,975.00

### Machinery

Allis-Chalmers Mfg. Co., Milwaukee and West Allis, Wis., turbines and governors .....	\$1,850,650.00
General Motors Corp., Cleveland Diesel Engine Division, Cleveland, diesel engine parts .....	14,941.04
Clyde Iron Works, Inc., Duluth, Minn., derrick boat equipment ..	14,500.00
Caterpillar Tractor Co., Peoria, Ill., tractors .....	17,486.00
The Warner & Swasey Co., Cleveland, lathes, turret .....	10,799.10
The Bullard Co., Bridgeport, Conn., turret lathe .....	11,173.55
The Noble & Westbrook Mfg. Co., East Hartford, Conn., marking press .....	10,250.00
Cincinnati Milling Machines & Cincinnati Grinders, Inc., Cincinnati, milling machines .....	16,477.00
The B. Jahn Mfg. Co., New Britain, Conn., burring machines ..	15,700.00
Nash Engineering Co., South Norwalk, Conn., and General Electric Co., Schenectady, vacuum pump..	13,752.00
The Galion Iron Works & Mfg. Co., Galion, Ohio, road rollers .....	11,226.80
Fuller Co., Catasauqua, Pa., pneumatic conveying system .....	13,998.00
The Harrington-Rex Co., Inc., Brooklyn, windlass assembly ...	12,244.10
Blackhawk Mfg. Co., Milwaukee, jack assembly .....	23,900.00
Manning, Maxwell & Moore, Inc., Bridgeport, Conn., valves .....	13,739.54
American Engineering Co., Philadelphia, steering gears .....	95,200.00
Atwood & Morrill Co., Salem, Mass., valves .....	57,961.30
Baldwin-Southwark Corp., Eddystone, Pa., valves .....	11,300.00
Turbine Equipment Co. of New England, Boston, gasoline motors, gear units .....	44,989.00

## Inland Steel Ship Carries Record Ore Cargo

THE steamer *L. E. Block* of the Inland Steel Co. loaded a record cargo at the Great Northern Railway Co. dock, Superior, Wis., on Sunday morning, June 25. The boat was loaded with 15,728 gross tons of iron ore from the Mesaba Range, which breaks the Lake Superior record of 15,726 gross tons established by the same boat in 1938. The steamer *L. E. Block* was loaded in about five hours at the dock.

The boat is the flagship of the Inland Steel Co. fleet and was built in 1927 at a cost of about \$1,000,000. She is 596 ft. in length and 64 ft. in width. The steamer *L. E. Block* is not only one of the largest boats on the Great Lakes, but is also one of the fastest.

The tonnage carried by the steamer is the all-time record cargo for iron ore on the Great Lakes, according to the Inland Steel Co.



**BATTERED BUT  
TOUGHNESS...  
NOT BROKEN**

**ALLOY  
NICKEL  
STEELS**

*Twelve years ago engineers of Automatic Transportation Co., Chicago, specified SAE 3135 Nickel-toughened steel for pinions in their industrial trucks. After*

*12 years' service, this Nickel alloyed material retained ductility and toughness to deform rather than break when ball bearings fell into the teeth.*

WHAT you need for dependable service — at lowest cost per year — is a tough material combining ample strength and hardness with unusually high ductility. A significant example of such a metal, which deforms rather than breaks, is this pinion pictured above. Balls from a shaft bearing of an industrial truck escaped from their race and fell into the teeth of this pinion gear.

After twelve years' service, this pinion — forged from heat treated SAE 3135 Nickel chromium steel — was still strong enough to stand up under crushing stress. Despite their ductility, these teeth proved too hard for redressing. Make sure of metals which will be strong and tough after twelve years' economical service. Specify Nickel alloyed materials for all vital parts which must resist stress and wear.

**THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.**





## You be the Judge

OF THE QUALITY AND  
PERFORMANCE OF THESE  
SUPERIOR PRODUCTS

On any basis — strength, accuracy, uniformity — these Parker-Kalon Cold-Forged Products pass every test with flying colors.

But you be the judge of that! Test them in your own plant, in your own way, under actual operating conditions. Find out why thousands of users have switched to Parker-Kalon. Send for samples today. No obligation.

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200 Varick Street, New York, N. Y.

**PARKER-KALON**  
*Cold-forged*  
**SOCKET SCREWS**  
**WING NUTS • CAP NUTS**  
**THUMB SCREWS**

SOLD THROUGH  
REPUTABLE DISTRIBUTORS

## Industrial Machinery Exports Show Gain

**W**ASHINGTON — The Commerce Department's Machinery Division reported last week that exports of industrial machinery during May reached a value of \$26,085,746, representing an 11 per cent increase over the May, 1938, figure. The division said that continued foreign shipments of metal-working equipment at peak levels, augmented by substantially increased sales of textile machinery, accounted primarily for the high trade volume during the month.

Exports of power-driven metal-working equipment, which decreased from the March peak of \$12,057,000 to \$8,854,755 in April, recovered in May to \$11,615,799, the second highest figure on record and a 28 per cent gain over the May, 1938, trade valued at \$9,078,953, the department said.

Practically all items in this group shared in the increase, the outstanding gains being represented by turret lathes, whose exports were valued at \$872,409 in May this year as against \$407,699 in the corresponding month of 1938; thread-cutting and automatic screw machines, \$619,940 as compared with \$422,314; milling machines \$1,510,986 as against \$590,101; planers and shapers, \$805,319 as against \$270,774; grinding machines, \$1,913,799 as against \$1,649,969; sheet and plate metal working machines, \$813,187 as against \$694,228; rolling mill machinery, \$1,209,654 as compared with \$549,104; and forging machinery, \$401,736 as compared with \$303,114.

Contributing to the high level of metal-working machinery exports were shipments during the first four months of this year to Japan, which totaled \$10,180,405; Soviet Russia, \$8,360,357; United Kingdom, \$6,998,169; and to France, \$4,421,481.

## Wean Offers a New Type Of Galvanizing Equipment

**W**ARREN, OHIO—The Wean Engineering Co., Inc., is offering to the trade a new type of galvanizing equipment for the production of exceptionally tight coat galvanized sheets which are used for deep drawing and forming operations.

The Wean development is said to result in lower dross formation in the pot and a clean sheet is produced. The combination of these two advantages, with a method of controlling the coating,

produces galvanized sheets at lower cost.

The Wean Engineering Co. has just installed four galvanizing units complete at the Wheeling Steel Corp., Steubenville works, and two heavy duty double bottom roll units have been shipped and installed at the Richard Thomas plant, at Ebbw Vale, Wales, for the coating of A.R.P. heavy gage sheets. The Steel Corp. of Bengal, India, is also installing four Wean galvanizing units in its new plant in India, and an additional unit is now being built for the Tata Iron & Steel Co., Ltd., Jamshedpur, India, this making the third galvanizing unit installed by the Wean company in this plant within the last few years.

## Britain, Short of Steel, Buys 400,000 Tons on Continent

**L**ONDON—The United Kingdom demand for steel is now so large that the British Iron and Steel Federation has recently placed orders on the Continent for 400,000 tons of semi-finished steel in addition to the 525,000 tons it will import this year under the cartel quota arrangement. A large proportion of these additional orders will be delivered over the next few months.

The additional supplies are needed principally for marginal plants which are only brought into operation in times of the greatest activity. Examples of these works are to be found in the tin plate industry in South Wales.

## Welsh Tin Plate Mills End Production Control

**L**ONDON—Welsh tin plate mills are now able to work to capacity without penalty. In order to speed up Government deliveries of tin plate, the Welsh makers have suspended the production quota for the rest of the year. There are many unexecuted orders on hand, but export business will not be affected.

The latest output is 63.13 per cent, compared with 27.09 per cent a year ago. The number of Welsh mills now operating is 264, against 116 last year. Makers have large accumulations of orders, and the current rate of output is dependent upon steel supplies.

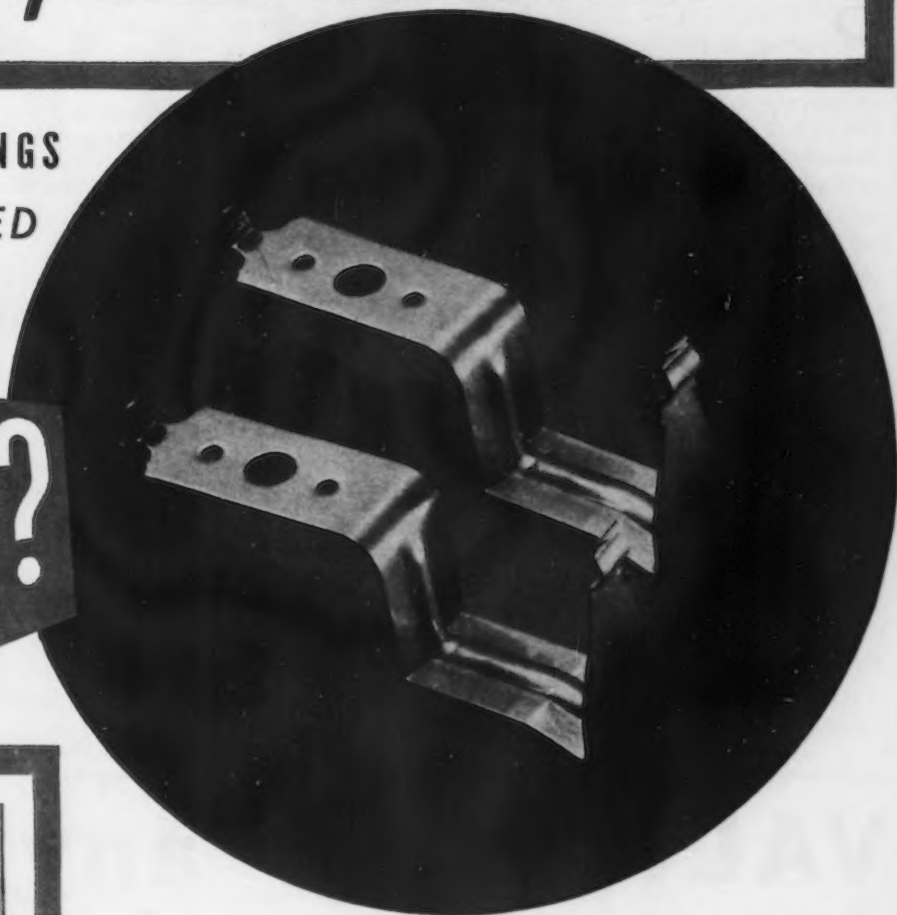
The continued scarcity of scrap has led to a temporary suspension of operations at one or two West Wales mills.



# Bright HARDENING

ONE OF THESE SPRINGS  
HAS BEEN HARDENED  
AND ONE HASN'T...

WHICH?  
IS  
WHICH?



IF YOU HARDEN SPRINGS,  
STAMPINGS, OR SIMILAR  
PARTS—CHECK THESE SAVINGS!

✓ **Cuts Production Costs:** Actual tests show Hydryzing increases production of small parts as much as 85% because of simplified handling.

✓ **Speeds Production:** No sandblasting and no cleaning. No waiting or lost time while parts are being shifted to other departments for cleaning operations.

✓ **Better Appearance:** Sandblasting or pickling always pits surfaces of work, however minutely. Hydryzed work has original smooth shiny surface so that plating is smooth and lustrous. Less buffing is needed to produce full lustre.

✓ **No "Soft" Work to be Rejected:** Hydryzed parts are fully hard because they are completely protected, while in furnace, against loss of carbon. Also, their clean, scale-less surfaces receive full benefit of quench insuring uniform hardness on every lot.

Does your production involve the hardening of springs, stampings, screw machine parts or other such small to medium size items? If so, you've probably wondered how you could harden those parts without scale or discoloration. You can! And not only harden them without scaling or discoloring, but harden them bright, so bright that you can place an unhardened piece beside one that has been hardened and not be able to tell which is which. Hundreds of thousands of springs and other parts are being **BRIGHT HARDENED** every day by means of the Hydryzing Process, and because Hydryzed parts come from the quench with their bright original finish, hundreds of dollars are being saved each week in the elimination of sandblasting and other cleaning costs. Consider the savings Hydryzing will make in your plant, in time, in labor and cleaning supplies *plus* the greatly improved appearance of the parts over those hardened by older methods. Just drop us a note and we'll send a packet of Hydryzed samples and descriptive literature.

**Lindberg Engineering Company**

228 North Laflin Street

Chicago, Illinois

# LINDBERG

CYCLONE FOR TEMPERING  
HYDRYZING FOR HARDENING

## Continuous Plate Mill Sold to Japanese

**P**ITTSBURGH — United Engineering & Foundry Co. here has received two orders for steel mill equipment from Japanese interests. United will furnish an 86-in. semi-continuous plate mill to the Nippon-Seitetsu Kaisha Steel Co. at Hirohata, Japan, and a small mechanical sheet mill to the Sumitomo Metal Industries, Ltd., at Osaka.

The plate mill will consist of slab heating furnaces, a universal breakdown mill, and four stands of four-high continuous finishing mills capable of rolling plate from  $\frac{1}{8}$  to 2 in. thick, and with an annual capacity of 1,000,000 tons.

According to the company, the plate mill will be delivered within a year and the sheet mill within six months, all the equipment to be produced at United's Pittsburgh, Vandergrift and Youngstown plants.

Mesta Machine Co., Pittsburgh, is completing a 46-in. slabbing-blooming

mill for the Nippon-Seitetsu Kaisha Steel Co., the same company which is to get the 86-in. continuous plate mill. This 46-in. slabbing-blooming mill being built by Mesta is similar to those installed at Inland Steel Co., Great Lakes Steel Corp., and Tennessee Coal, Iron & Railroad Co., and will have a capacity in excess of 1,000,000 tons.

## Libbey-Owens-Ford May Build New Glass Plant

**T**OLEDO—The new insulating glass known as "Thermolux," to be marketed extensively by Libbey-Owens-Ford Glass Co., may soon require the development of special plant facilities for manufacture, according to Harold Alexander, of the architectural department of Libbey-Owens-Ford. This new product is a sandwich of two sheets of plate glass with glass fiber filler. In addition to insulating qualities and strength the new glass diffuses light and is susceptible to color applications.

## Germany Using More Low-Grade Ore

**L**ONDON—Germany is using an increasing proportion of low-grade ore in steel production. This is indicated by the fact that the daily output of Thomas quality (basic bessemer) steel in April amounted to 33,600 tons, an increase of more than 20 per cent on the total of 28,100 tons in April, 1938.

By contrast open-hearth steel production during April, at 42,500 tons per day, was only a little over 1 per cent higher than a year ago. This change in the ratio between the two qualities should be accentuated when the Hermann Goering works is completed at Saltzgitter. This works will utilize large quantities of low-grade iron ore.

These figures illustrate the differing practice adopted by Germany compared with other European countries. Whereas almost as much Thomas steel as open hearth is being produced in Germany, the British open hearth total in May was 1,100,000 tons, against only 64,000 tons of basic bessemer.

The larger output of Thomas steel is held to explain partially the lower quality of German steel exports. Germany is understood to be short of manganese for alloy steel production, so great has been the demand for armaments.

## Iron Processing Corp. Formed at Canton, Ohio

**C**ANTON, OHIO—The Canton Development Corp. has announced the formation of the Iron Processing Corp., which will develop and use processes invented by T. F. Baily of Canton, for the making of iron and steel products. Owing to the experimental nature of the process, the company is withholding further details from publication at this time. The new company will occupy the factory formerly owned by the American Forge & Machine Co. at Cleveland Avenue and 17th St. S.W., Canton, and will shortly install equipment there.

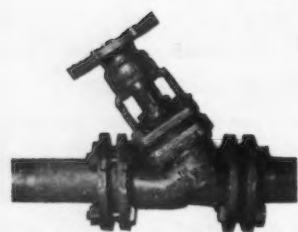
Officers of Iron Processing Corp. are: John Quinn, president; H. E. Theiss, vice-president; Kenneth B. Cope, secretary; H. E. Patrick, treasurer; T. F. Baily, general manager.

The company expects to start operations about Aug. 1, and will employ a small operating personnel until the processes are fully developed and perfected.

# VALVES for any acid service

### The Y Valve

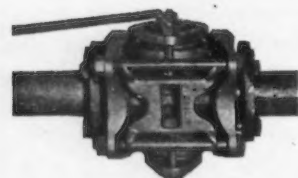
Acid resisting . . . for places where valve is seldom turned . . . rising stem . . . outside screw and yoke . . . full opening . . . can't stick or score . . . all parts mechanically aligned . . . split flanges for Duriron pipe; companion flanges for lead or screwed pipe.



Y Valve

### The Duriron-Nordstrom Valve

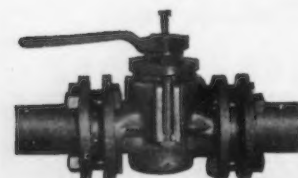
Acid resisting . . . plug valve with lubricant ducts . . . plug releases by hydraulic pressure . . . seating surface lubricated . . . lubricating ports prevented from contacting solution handled . . . useful with acids having no lubricating properties.



Duriron-Nordstrom Valve

### The "P. R." Valve

Acid resisting plug valve with mechanical plug-releasing feature . . . valuable for handling acid sludges and solutions containing abrasives . . . and where lubricated valve is not permissible.



"P. R." Valve

Send for Bulletin No. 601 for details

**THE DURIRON CO., Inc.**  
438 N. Findlay St. Dayton, Ohio

# YOU *can help defend the machine!*

The second in a series of six presentations by Mr. J. H. Van Deventer in defense of the machine, was published in *The Iron Age*, June 8, pages 11 to 18. It is entitled "He's Back in 1899 and Doesn't Know It."

You can help the defense of the machine by distributing reprints where you think they will do the most good.

Reprints of the 8-page article printed in 3 colors on India tint stock may be obtained at the following prices:

100 reprints - - - -	\$ 5.00
500 reprints - - - -	18.00
1,000 reprints - - - -	30.00

*The next four defense presentations will appear July 13,  
August 10, September 14 and September 28*

## THE IRON AGE

A Chilton ❶ Publication

239 WEST 39TH ST.

NEW YORK



## Detroit Still Agitated Over Foreign Pipe Order

**D**ETROIT—The question of whether the City of Detroit should award a contract for cast iron pipe to a foreign concern which was low bidder remains unsolved while the Water Board has taken care of the immediate problem of getting a supply of pipe by borrowing a sufficient amount from the Wayne County Road Commission. With the borrowed pipe, the Water Board will keep municipal

work going until the Common Council and Mayor Richard Reading determine whether the mayor's "buy American policy" can override the corporation counsel's interpretation of a charter provision which makes awards of orders to low bidders mandatory. The council had attempted a compromise solution by awarding two-thirds of an order for 30,000 ft. of water pipe to the Pont-A Mousson Co., Nancy, France, and the remaining one-third to an American bidder, the Lynchburg Foundry Co., Lynchburg, Va., to obtain prompt delivery.

## This Week on the Assembly Line

(CONCLUDED FROM PAGE 68)

started a revolution in the agricultural implement industry which is even now going on.

Ford's entrance into the tractor and implement industry is regarded as more than a mere thrust; it has been assayed as the beginning of a new era of improvement redesign, retooling and lower prices in this industry. Ford, himself, declares that he is determined to mechanize all farms and, in doing so, restore farm prosperity and initiate again a period of industrial prosperity.

### Automobile Production Declines

The automobile industry last week, in keeping with the expected seasonal trend, reduced production to 70,663 units from the previous week's 81,070, according to Ward's Automotive Reports. The total, however, made a favorable showing in comparison with the 43,945 units produced in the corresponding week of last year. Ford, Lincoln-Zephyr and Chevrolet maintained the level of production which they struck last week—19,200, 500 and 18,000, respectively. Plymouth declined slightly from 11,400 to 10,800.

The holiday this week resulted in the loss of one to five days in various plants and will sharply reduce the total output. Within another two weeks the majority of automotive plants will have completed 1939 production and some will be initiating 1940 model runs.

### Mediation of GM Dispute

Efforts to mediate the dispute that has threatened a strike of 8000 tool and die, engineering and maintenance employees of General Motors Corp. are being made by James S. Dewey, National Labor Relations Board conciliator. Dewey entered the picture last week and arranged meetings which were held in the General Motors Building to attempt to avert the UAW-CIO strike.

The strike threat, over the question of using the union label on tools, dies, jigs and fixtures, leaves a most important question unsettled. In Detroit there are no "union shops" or "closed shops." Although most of them are organized by the CIO, none at present could say that all of its output is "made by union labor." The conclusion is, that once a large user of tools, dies, jigs and fixtures has agreed to limit itself to the use of products with the union label—then the CIO would attempt to force union shop agreements on the tool and die industry.

## More Profit from New 2 1/2' SUPER SERVICE RADIAL



7 1/2" Column  
1 H. P. Motor  
3 or 6  
SPINDLE  
SPEEDS

This new addition to the Cincinnati Bickford line of Super Service Radials has been developed primarily for production drilling and tapping of small holes. However, profitable hole production is assured on a wide range of work due to increased savings in time, power and floor space.

The many features and advantages of this New 2 1/2' Super Service Radial are described in Bulletin R-26. Write for it today.



**THE CINCINNATI BICKFORD TOOL CO.**  
OAKLEY CINCINNATI OHIO U.S.A.

## Labor Election Ordered for Alabama By-Products Corp.

WASHINGTON — The National Labor Relations Board on June 29 announced that a secret ballot collective bargaining election would be held within 15 days to determine whether employees of the Alabama By-Products Corp., coke oven division, Tarrant, Ala., want to be represented by the CIO United Mine Workers of America or the A F of L By-Products Workers Union, or by neither. The board said that during a hearing the CIO union introduced 142 authorization and membership cards. Also, it was stated, the CIO union introduced 119 authorizations which were obtained from among union members as well as non-members. The AFL union, it was stated, introduced 116 membership and authorization cards. According to the board there are approximately 215 employees within appropriate unit. The representation question, it was found, could best be determined by an election.

## Germany to Scrap Seven Old Blast Furnaces

HAMBURG — Seven blast furnaces, which have been idle for many years and are high-cost units, will be scrapped in the period between July, 1939, and June, 1940. The total number of blast furnaces available in June, 1940, not including those to be scrapped, will be about 195, of which nearly 30 will be less than six years old. All of these are of large capacity. The furnaces under construction are of about 950 tons daily capacity, a size that seems to pay better than the large ones of 1150 and 1200 tons daily capacity which were built in 1927 and 1928.

## Zirconium Copper Concentrate

ZIRCONIUM-COPPER, a new material for improving standard brasses and bronzes, is now supplied in the form of a concentrate by P. R. Mallory & Co., Inc., Indianapolis. The zirconium not only acts as a deoxidizer and scavenger of a melt, but when alloyed with manganese bronzes, aluminum bronzes, and others, it is said to give increased hardness and tensile strength, higher thermal and

electrical conductivity, and improved corrosion resistance.

The zirconium-copper concentrate has been found to be of particular advantage in producing nickel bronzes. The ductility of such alloys is substantially increased, giving greater reliability to sand cast material.

Mallory metallurgists have developed new methods of heat-treating zirconium bearing alloys to further improve their properties and make them particularly resistant to creep and oxidation at elevated temperatures.

Proper melting and pouring methods have also been worked out.

Two standard concentrations, containing 12½ per cent and 35 per cent zirconium, are supplied. They are produced by the "Hydrimet" process. The most widely used concentration is the 35 per cent zirconium-copper which is furnished in the form of bars and lumps having a high density. The concentration will alloy immediately and without difficulty with a melt, resulting in the highest recovery of zirconium.



**For Hot, Heavy Work—  
STEEL PICKS PENOLA**

STEEL men can't afford to skimp on roll neck bearings or reduction gears. With high-friction steel jobs as tough as they are today, it pays to get the *best!*

And to protect this fine, expensive machinery against damaging friction, these same buyers aren't satisfied with merely "adequate" lubricants. They want a margin of *safety*. That's why they *specify Penola!* Then they know that those

5000-pounds-per-square-inch pressures won't result in disastrous metal-to-metal contact.

We think it's significant that 80% of the 4-high mills in this country protect such big rolling mill investments with Penola. Penola has been the *heavy* favorite with men who make steel for over half a century.

### PENOLA LUBRICANTS

Penola, Inc., Pittsburgh, Pa.  
(Formerly Pennsylvania Lubricating Company)  
New York • Chicago • Detroit • St. Louis

**LUBRICANTS FOR THE STEEL INDUSTRY SINCE 1885**



# ... PERSONALS ...

FRANK S. O'NEIL has been appointed general manager of the Link-Belt Co. plants in Indianapolis, where he has been assistant general manager for the last seven years. He joined the Link-Belt organization 33 years ago at the company's Chicago plant, where he worked 10 years in the foundry,

machine shop, cost department, and rate setting and production departments. His Indianapolis plant experience dates back to 1916, the year in which he was transferred there from Chicago. While at Indianapolis, he successively served as assistant superintendent, in charge of malleable iron

chain assembly, superintendent of the Ewart plant, and assistant general manager of both Ewart and Dodge plants.

♦ ♦ ♦

W. W. NOBLE has been made district sales manager of Pittsburgh Crucible Steel Co.'s Cleveland office, succeeding the late K. E. Porter. Mr. Noble formerly was district sales manager of the company's Detroit office. He started in the steel business in 1913 with Carbon Steel Co. In 1923 he went with Pittsburgh Crucible in the Pittsburgh office and later in the New York office as district manager. In 1925 Mr. Noble left Pittsburgh Crucible to organize the Anchor Drawn Steel Co., Latrobe, Pa., serving as vice-president and sales manager, and returned to Pittsburgh Crucible in 1926. He has been in the Detroit office since 1927.

WILLIAM G. HASSEL has been appointed district manager of Pittsburgh Crucible Steel Co.'s Detroit office, in charge of sales and metallurgical activities. After graduating from Penn State as a metallurgical engineer, Mr. Hassel was associated for 13 years with the American Steel & Wire Co. and, for the past three and a half years, has been sales engineer for Pittsburgh Crucible.

♦ ♦ ♦

O. F. METZ, former manager of the El Paso, Tex., office of Allis-Chalmers Mfg. Co., Milwaukee, has been made district manager of the combined El Paso and Phoenix, Ariz., offices. The combination of the two territories followed the recent retirement of J. B. COOPER, manager of the Phoenix branch. H. H. ROTH, of Phoenix, has been transferred to the El Paso office. Mr. Metz has been with Allis-Chalmers since 1913.

♦ ♦ ♦

HAROLD H. SHAW, has been named head of the personnel department of the Motor Wheel Corp., Lansing, Mich. Shaw has been with the company since 1919.

♦ ♦ ♦

JAMES TATE, director of sales and advertising at Delta Mfg. Co. (now Timken-Detroit Axle Co.), Milwaukee, has been elected president of the Milwaukee Association of Industrial Advertisers. He succeeds WALTER E. SCHULTZ, advertising and sales pro-



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motional manager of the same concern. Other officers are P. C. RITCHIE, Waukesha Motors Co., vice-president, and L. H. BILLINGS, Falk Corp., secretary-treasurer.

♦ ♦ ♦

J. L. McCLOUD, metallurgical chemist, Ford Motor Co., was nominated recently as a member of the executive committee of the American Society for Testing Materials.

♦ ♦ ♦

G. K. DREHER, of Ampco Metal, Inc., Milwaukee, has been elected chairman of the Milwaukee chapter, American Society for Metals, to succeed PROF. J. E. SCHOEN, Marquette University. PROF. J. F. OESTERLE, University of Wisconsin, has been named vice-president, and E. G. GUENTHER, secretary-treasurer.

♦ ♦ ♦

R. O. HULL, of the electroplating division of E. I. du Pont de Nemours & Co., has been awarded the Proctor Memorial prize by the American Electro-Platers Society for "the development of an improved simple method for determining irregularities in electroplating solutions before they are applied."

♦ ♦ ♦

A. M. DUDLEY, engineering representative in the patent department of Westinghouse Electric & Mfg. Co., has received the honorary degree of Doctor of Engineering from the University of Michigan. He has been identified with the Westinghouse company for 35 years.

♦ ♦ ♦

DR. W. A. WESLEY, of the research laboratory of the International Nickel Co., has been awarded the gold medal of the American Electro-Platers Society in recognition of his paper on "Physical Properties and Uses of Heavy Nickel Deposits."

♦ ♦ ♦

WALTER F. STREHLOW, chief engineer of the Allis-Chalmers Mfg. Co., tractor division, Milwaukee, has been named chairman of the Milwaukee section, Society of Automotive Engi-

neers, to succeed JOHN J. HILT, Racine, vice-president of the Young Radiator Co.

♦ ♦ ♦

LESTER M. CURTISS, who has been assistant general superintendent of Lukens Steel Co., Coatesville, Pa., has been appointed general superintendent in charge of all operations of the company, succeeding G. DONALD SPACKMAN, who has been granted a leave of absence at his own request because of

ill health. Mr. Spackman will continue to serve the company in an advisory capacity and will resume active duty with Lukens when his health permits.

Mr. Curtiss was graduated from Lafayette College in 1916, with a degree in chemical engineering. For a number of years he was identified with a number of chemical manufacturing companies and joined the Lukens company as assistant engineer of tests in 1919. Four years later he was made engineer of tests and in 1925

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And, eye appeal makes any product just a little easier to sell.

Many makers of welded equipment realize this fact and rely on Murex Electrodes for the sort of welding that is not only sound, and lives up to every physical requirement, but also is clean-cut and looks the part.

Write and ask to have a representative show how Murex assures smooth deposits and perfect contours, with minimum spatter and undercutting even at extremely high currents.



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1 This welded shear is strong, rigid, precise—and looks it. Flawless, well-shaped welds play their part. Photo: Cincinnati Shaper Co., Cincinnati, Ohio.

2 Murex welded seams in this heat exchanger suggest careful fabrication. Photo: Struthers-Wells, Warren, Pa.

3 Smooth, clean Murex deposits make welded parts neat and trim. Photo: The Dorr Company, Denver, Colo.



4 Good proportions of this mill drive suggest strength. Well-formed Murex welds help. Photo: Farrell-Birmingham Company, Ansonia, Conn.



5 Ruggedness is apparent in this tunnel type shovel. Welds, too, look sound and strong. Photo: Marion Steam Shovel Company, Marion, Ohio.



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**THE SUPERIOR SHEET STEEL CO.**  
 CANTON, OHIO  
Division of Continental Steel Corp., U. S. A.



was promoted to assistant superintendent of plate mills. He was made superintendent of the 140-in. and the 206-in. mill in 1928 and four years later became superintendent of plate mills. Later he became superintendent of production and in 1936 was elevated to the position he has held to the present time.

♦ ♦ ♦

JACK LULAND, of the Atha Works of Crucible Steel Co. of America, Harrison, N. J., was honored at a reception and luncheon in the executive offices of the company in New York on June 29 on his completion of 66 years of service with the company. He is 87 years old. FRANK MORGAN, who has been a regular employee for 59 years, was also honored at the luncheon by RAOUL E. DESVERNINE, president of the company.

♦ ♦ ♦

C. J. EDWARDS has been appointed Detroit district sales representative of LaSalle Steel Co., Chicago, succeeding the late J. R. Ide. Mr. Edwards will maintain his own offices at 2210 Fisher Building.

♦ ♦ ♦

GEORGE J. MEAD has resigned as a director and member of the executive committee of the United Aircraft Corp. Last March Mr. Mead declined reelection as vice-president and chief engineer. He was one of the original founders of the Pratt & Whitney Co., now the aircraft division of the United Aircraft Corp.

### Steel Employment Declined Slightly During May

A SMALL decline in employment in the steel industry in May is shown in a report by the American Iron and Steel Institute. During the month 447,000 employees were on the industry's payrolls compared with 452,000 in April, and 436,000 in May, 1938. The industry's payrolls in May amounted to \$60,372,000 compared with \$58,517,000 in April and \$46,757,000 in May, 1938.

Wage-earning employees in the industry earned an average of 83.5c. per hr. in May, against 82.9c. in April and 83.6c. in May, 1938. The number of hours worked per week per wage earner averaged 32.7 in May against 32.1 in April and 24.4 in May of last year.



## ... OBITUARY ...

WALLACE FOREST MACGREGOR, director and chief engineer, J. I. Case Co., Racine, Wis., died two weeks ago, after an illness of three months, aged 65 years. Mr. MacGregor was a leading farm implement engineer, and had much to do with the development of modern threshers, combines, and other farm machinery. At one time he served as president of the American Society of Agricultural Engineers and at his death was a member of the ASME.



FREDERICK C. A. H. LANTSBERRY, president and director of William Jessop & Sons, Inc., New York, died at his home in Scarsdale, N. Y., on June 29 after a long illness. He was 55 years old. He was born in England and was graduated as a chemical engineer from the University of Manchester. For a time he was employed by the British Westinghouse Co. and later was identified with the Birmingham Small Arms Co. and with the Brightside works of William Jessop & Sons as managing director. He came to this country 11 years ago as president of the Jessop company.



JOSEPH V. BANKS, vice-president of the Reed & Prince Mfg. Co., Worcester, Mass., and manager of that company's Chicago office and warehouse, died of heart disease on June 6.



JOHN DIDIER, retired founder of the Rhinelander Iron Co., Rhinelander, Wis., died at his home following a brief illness. He was 81 years old.



LEONARD E. MEYER, for many years correspondent for THE IRON AGE in the Milwaukee area, died recently of heart disease at his home in Whitefish Bay, Wis., at the age of 52 years.



GEORGE FREDERICK STEELE, a pioneer in the growth of the General Electric Co., died at a Boston hospital on June 25. Mr. Steele was born in Derry, N. H., 76 years ago, was graduated from Massachusetts Institute of Technology, and in 1885 became associated with the electrical manufacturing industry, first with the then three-year-old Thompson-Houston Electric Co., Lynn, Mass., and from 1890 to 1892 with the Edison-General Electric Co., which later became the General Electric Co. In 1911 he was made district manager for the power and mining division. He retired in 1931.

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In guarding these all important small costs no safer policy can be adopted than to make it a rigid rule to use ARMSTRONG TOOL HOLDERS on every possible operation, for in the Armstrong System lies fundamental principles of economy and efficiency that are universally accepted as the basis for modern shop practice. (1st) The Saving of "All Forging, 70% Grinding and 90% High Speed Steel" by using cutter bits ground from stock shape of High Speed Steel in a permanent ARMSTRONG TOOL HOLDER. (2nd) The efficiency of ARMSTRONG cutting tool design, based on continuous research and tests and backed by world wide experience. (3rd) The elimination of single purpose cutting tools and their replacement—permanent multi-purpose ARMSTRONG TOOL HOLDERS each of which effectively equals a complete set of forged bar tools.

The Armstrong System provides ARMSTRONG TOOL HOLDERS for every operation on lathes, planers, slotters and shapers and ARMSTRONG TURRET LATHES and SCREW MACHINE TOOLS for turret lathes and screw machines. Keep up with developments in the Armstrong System. Write for an ARMSTRONG Catalog today.

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## Britain to Control All Scrap Exports

**L**ONDON—Power to buy all scrap metal which might otherwise go abroad has been given to the British Minister of Supply, Leslie Burgin.

Mr. Burgin told the House of Commons recently that he would be empowered to obtain throughout the Empire all the supplies of essential raw materials for the manufacture of arm-

aments. He said that machinery had already been set up for the administrative arrangement by which close and intimate contact might be maintained with the Board of Trade in such matters as the purchase of stocks of raw materials.

Mr. Burgin added that there would be something in the nature of a council, board or committee almost continuously in session presided over by himself in connection with the purchase of supplies.

Mr. Burgin made this statement after he had been asked by C. Williams for an assurance that he had definite power to limit the exportation of scrap.

"I have power to buy the whole of it," Mr. Burgin answered, and pointed out that his powers applied to supplies throughout the Empire. He also has power to stop or limit the production of non-essential articles.

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workmanship, careful inspection, modern methods and up-to-date equipment . . . all continued over years of progressive development.

R B & W products have always been noted for their accuracy and quality; for their standards of strength, finish and thread fit; for the engineering skill which these features reflect.

Such engineering skill has made **EMPIRE Brand Bolts, Nuts and Rivets** the indisputable standard in all industries the world over.

**BOLTS:** Carriage • Machine • Lag • Plow • Stove • Elevator • Step • Tap • Wheel & Rim • Battery • U-Bolts • Tire • Automotive • Drilled • Faced • Special Heat Treated • Etc. • **NUTS:** Cold Punched • Semi-Finished • Hot Pressed • Case Hardened • Slotted • Castle • Machine Screw • Marsden Lock • Low Sulphur • **RIVETS:** Standard • Tinnings • Coopers • Culvert • Clevis and Hinge Pins • **SCREWS:** Cap • Machine • Hanger • Sheet Metal • Phillips Recessed Head • **WASHERS:** Plate • Burrs • **MATERIALS:** Steels • Alloys • Non-ferrous Metals • Brass • Bronze • Everdur • Herculoy and others • **RODS:** Stove • Seat • Ladder • **PLATED PARTS:** Cadmium • Zinc • Chromium • Nickel • Hot Galvanized • Copper • Tin • **SPECIAL UPSET & PUNCHED PRODUCTS**

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 SALES OFFICES: CHICAGO • DETROIT • PHILADELPHIA  
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## Safety Records Improving In Metal Industries

**C**HICAGO—The metals section of the National Safety Council has tabulated the injury experience for 1938 among the various industries included within that section. The results are as follows:

Industry	Man-Hours Worked (thousands)	Frequency		Severity	
		Rate	Rate	Rate	Rate
All industries . . .	5,502,520	12.18	1.53		
Steel . . . . .	497,297	6.56	1.84		
Machinery . . . . .	512,527	8.29	0.70		
Non-Ferrous . . . . .	111,626	8.32	1.95		
Metal products . . .	151,664	10.05	0.80		
Foundry . . . . .	57,761	18.42	0.88		

The showing of the steel industry in frequency in comparison with other industries was particularly good, the safety council said, steel plants ranking third best among 30 major industries. Machinery had good standing in severity, ranking eighth. All branches of the section reduced rates when compared with 1937. The improvement in foundry experience was especially marked.

Industry	Reduction in Frequency		Reduction in Severity	
	1937 to 1938	1936 to 1938	1937 to 1938	1936 to 1938
	Per Cent	Per Cent	Per Cent	Per Cent
	Cent	Cent	Cent	Cent
All industries . . .	16	68	5	44
Foundry . . . . .	43	74	52	87
Machinery . . . . .	31	53	25	51
Metal products . . .	31	69	22	66
Non-Ferrous . . . . .	22	64	19	13
Steel . . . . .	21	69	14	29

## Independent Union Organized At Allis-Chalmers Plant

**A**N independent union has been organized at the Allis-Chalmers Mfg. Co., Milwaukee, in competition with the United Automobile Workers Union, CIO, according to George Sprague, who was chairman of the organization meeting. Officers and an executive board have been chosen by the group which claims a 500 membership. Names of the leaders of the new union will be withheld until the union has received a charter from the state, Sprague said.

## Prejudices Affect Progress in Welding, Says J. F. Lincoln

**"M**ANY people are attempting to make standards for welding without sufficient knowledge of the facts," says J. F. Lincoln, president, Lincoln Electric Co., Cleveland. "Many people also are sure of a great many facts about the subject, the only difficulty being that these facts are just not so.

"That welding has lived through its childhood under these conditions and grown to manhood is remarkable and shows how strong is its constitution," he added.

"Welding must have parents but there should not be so much doubt thrown on its paternity. Standards of conduct are necessary but they must be founded on fact and need.

"There is no doubt that a great deal of the work which has been done to perfect and test welding, has been helpful. It is necessary however, that any standards be founded on fact rather than fiction. The following facts learned from experience are true:

"1. The shielded arc deposited metal is definitely stronger than mild steel plate under all conditions.

"2. The shielded arc weld metal is a good deal more homogeneous than mild steel plate, hence less apt to defect.

"3. The making of a weld with the shielded arc requires very little skill, particularly in the downhand position. The chance of that weld metal being as good as the parent metal is tremendously better than the chance of the parent metal being as good as the weld.

"In spite of these facts we still have any number of people in positions of authority who insist on limitations, which are neither necessary nor intelligent. For instance, the Interstate Commerce Commission insists that to weld a tank car which carries liquids at no pressure, is dangerous. The fact that the tanks into which the oil goes from these tank cars must be welded to remove the chance of leakage, does not affect them. The further fact that this oil was distilled at a pressure of over 1000 lb. per sq. in. at over 1000 deg. F. temperature, in an arc welded vessel, disturbs them not at all.

"The Interstate Commerce Commission still insists that a locomotive boiler cannot be welded, although the locomotive superheater which carries

the same steam pressure at a higher temperature in the same boiler, must be welded.

"Authorities still insist that the skin of a ship shall not be welded in spite of the fact that the boilers inside the ship, carrying very high pressures,

are welded. They still insist that many pressure vessels must be riveted because of the danger to life and yet 30 million automobiles in this country depend for their success on untested welds. The failure of any automobile weld would result in much greater loss of life than would be true of failure of many pressure vessels. In spite of all these facts welding is condemned or so restricted as to eliminate its economies.

"This condition is not unusual.

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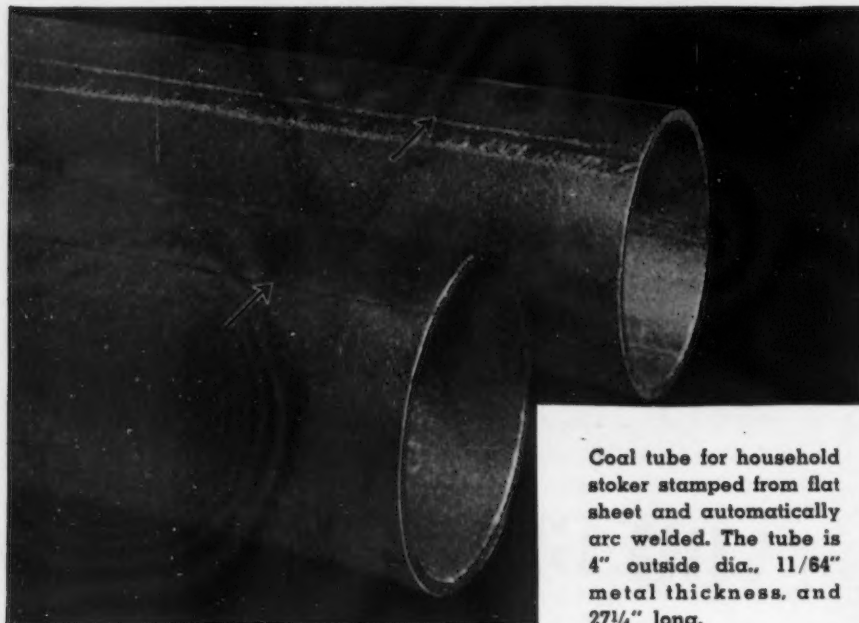




Perhaps because welding is a new industry the added care which these frequently silly requirements enforce is in the right direction, but unless this insanity is stopped at some reasonable point, the cost of fabrication will be unnecessarily and unduly increased.

"The statement is often made that welding is alright provided the man who does the work is sufficiently skilled and careful. In many cases the operator must be tested every few

months, or even days, in order to satisfy the inspector. It is doubtful if this is necessary. It is probably a good deal more difficult to make a weld which is worse than the parent metal than it is to make one which is better. With proper electrode, proper size and type of welding machine, and proper oversight by the foreman, it is a practical impossibility for any weld to be made which will not be better and more reliable than the metal itself."



Coal tube for household stoker stamped from flat sheet and automatically arc welded. The tube is 4" outside dia., 11/64" metal thickness, and 27 1/4" long.

## Welded By Carbon Arc Method With Automatic Head

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Perhaps a study of your product by Parish Engineers will show how you can reduce the cost of parts in many ways. Their job is to help solve your problems, why not write today?

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PACIFIC COAST REPRESENTATIVE, F. Samers Peterson Co., 57 California St., San Francisco, Cal.

## Stresses in Rigid Steel Frames Are Computed By Bureau of Standards

**W**ASHINGTON—Computation of the stresses in the component members of a rigid steel frame, heretofore a baffling problem to designers and engineers, is now possible, says a report of the Bureau of Standards. Designers, it is pointed out, have hesitated to employ rigid frames because no satisfactory method of computing the stresses in their component parts has been available.

In an engineering structure, if various members which radiate from a common point are free to move about a pin connection, the stresses in each member may be calculated in advance, and the structure is said to be "determinate." All the older iron bridges and roof trusses were of this type.

Component parts of rigid frames, however, are joined by rivets or by welding, so that no motion can take place and calculation of the stresses by the usual methods is impossible. This renders the design "indeterminate" and a more or less unknown quantity.

High capacity testing machines of the Bureau of Standards have been developed in which even a large rigid frame can be subjected to full service load. The bureau has also developed strain gages by which the actual stress in any member of a complex structure can be easily measured.

This combination affords designers complete information on the behavior of structures under service conditions.

The bureau's investigation of stress distribution in steel frames was made with the cooperation of the American Institute of Steel Construction. Specimen used in the tests was donated by Lukenweld, Inc.

## SWOC May Plan New Campaign in Steel Mills

**P**ITTSBURGH—According to Philip Murray, chairman of the SWOC, a meeting of 50 sub-regional directors throughout the country has been called for July 24 at Chicago to last two or three days. The union's progress and the probable formation of a new organizing drive in the non-union steel mills will be the chief topics.

The SWOC has opened a summer camp at Frankford Springs about 30 miles from Pittsburgh, which will combine vacation activities and study of union and management problems.



## New Officers Elected By American Management Ass'n.

NEW officers and directors of the American Management Association have been announced.

The association is headed by Alvin E. Dodd who continues as president.

Other officers are: Chairman of executive committee—Thomas Roy Jones, president, American Type Founders, Inc.; chairman of finance committee—Harold V. Coes, manager of Industrial department, Ford, Bacon & Davis, Inc.; treasurer—James L. Madden third vice-president, Metropolitan Life Insurance Co.; secretary—Henry J. Howlett.

Divisional vice-presidents for the term 1939-1940 are: Finance and accounts division—F. B. Flahive, comptroller, Columbia Gas & Electric Corp.; office management division—Norman C. Firth, managing editor and business manager, *Dun's Review*; personnel division—J. W. Dietz, personnel relations manager, Western Electric Co., Inc.; production division—Raymond S. Perry, vice-president, Ingersoll Milling Machine Co.; industrial marketing division—E. O. Shreve, vice-president, General Electric Co.; consumer marketing division—Irwin D. Wolf, vice-president, Kaufmann Department Stores, Inc.; insurance division—Ralph H. Blanchard, School of Business, Columbia University.

New directors of the association elected for the term ending in 1942 are: W. L. Batt, president, SKF Industries, Inc.; C. R. Dooley, manager of industrial relations, Socony-Vacuum Oil Co., Inc.; M. B. Folsom, treasurer, Eastman Kodak Co.; Thomas J. Harte, vice-president, North American Cement Corp.; E. C. Johnson, president, H. A. Johnson Co.; Edgar Kobak, vice-president, Lord & Thomas; J. H. Nickell, insurance manager, Philadelphia Electric Co.; Ernest F. Rumpf, vice-president, Pittsburgh Coal Co.; John A. Stevenson, president, Penn Mutual Life Insurance Co.; C. L. Stivers, office manager, Jewel Tea Co., Inc.

## Porter-Cable Sales Gain 41% Over Last Year

THE Porter-Cable Machine Co., Syracuse, N. Y., manufacturer of floor sanders and maintenance equipment, electric hand saws and other machinery reports a 41 per cent increase in sales during the first six months of 1939 compared with the same period in 1938.

## Liaison Officer Named for U. S. Foreign Services

WASHINGTON—George Wythe, chief of the Latin-American Section, Bureau of Foreign and Domestic Commerce, has been appointed as liaison officer between the Department of Commerce and the Department of State and assumed his new duties on July 1, when the foreign services of the two departments were merged. Secretary of Commerce Hopkins said that among the major responsibilities of Mr. Wythe will be

that in connection with the transmission of economic and business information coming to the State Department from the field of the Bureau of Foreign and Domestic Commerce.

The American Import & Export Bulletin, 8 Bridge Street, New York, has published in its June issue a complete commercial description of each of the 60 foreign government exhibits and pavilions at the New York World's Fair.

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- BRONZE
- BRASS
- MONEL METAL
- OTHER ALLOYS

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# THE NEWS IN BRIEF

New light-weight, low-cost farm tractor which was demonstrated last week at Henry Ford's farm is expected to revolutionize farm work and farm machinery manufacture.—Page 66.

Automobile production starts seasonal decline . . . New models will be started within the next two or three weeks.—Page 66.

Automobile industry tells Senate Education and Labor Committee that Wagner Act has created unrest and turmoil instead of reducing labor disputes.—Page 70.

Tractors lead in exports of farm machinery; other types of farm equipment at lower levels than a year ago.—Page 72.

Upward trend in railroad equipment exports was halted in 1938, according to Department of Commerce.—Page 72.

Iron and steel scrap consumption in May estimated at 2,263,289 tons.—Page 72.

American Bridge Co. gets Grand Coulee Dam job.—Page 72.

Government machinery awards in week ended June 24 totaled \$2,260,287; iron and steel awards were \$686,372.—Page 74.

\$25,000,000 contract for airplane engines, largest since the World War, awarded by U. S. Army.—Page 74.

Inland Steel Co. ship carries record iron ore cargo.—Page 74.

Great Britain purchases 400,000 tons additional of semi-finished steel on the Continent.—Page 76.

Industrial machinery exports in May were 11 per cent over those of May, 1938.—Page 76.

Welsh tin plate mills end production restrictions.—Page 76.

Germany is using an increasing proportion of low-grade ore in steel production.—Page 78.

Continuous plate mill, 86 in. wide, sold to Japanese company by United Engineering & Foundry Co.—Page 78.

Iron Processing Corp. formed at Canton, Ohio, to develop new iron and steel process.—Page 78.

Libbey-Owens Ford Co. may soon build new plant for manufacture of new insulating glass.—Page 78.

Detroit officialdom still agitated over question of buying foreign cast iron pipe.—Page 80.

Wean Engineering Co. is offering a new type of galvanizing equipment for production of exceptionally tight coat galvanized sheets.—Page 80.

Germany to scrap seven old blast furnaces.—Page 81.

Zirconium copper concentrate developed by P. R. Mallory & Co.—Page 81.

Collective bargaining election ordered for Alabama By-Products Corp.—Page 81.

Employment by steel mills declined slightly during May.—Page 84.

British Minister of Supply is given power to buy all scrap which might go abroad.—Page 86.

Independent union organized at Allis-Chalmers plant.—Page 86.

Safety records are improving in metal industries, according to National Safety Council.—Page 86.

Stresses in rigid steel frames are computed by U. S. Bureau of Standards.—Page 88.

SWOC, to meet in July, may plan new drive against non-union steel mills.—Page 88.

Iron and steel carloadings expected to be 24.1 per cent higher in third quarter than in same quarter last year.—Page 92.

American Rolling Mill starts work on \$4,500,000 improvements at Middletown, including new blooming mill.—Page 92.

Federal Agency shifted under reorganization plan; J. M. Carmody becomes head of PWA and WPA.—Page 93.

President Roosevelt signs new tax bill but declines to predict its effect on business.—Page 94.

Unemployment declined 2.9 per cent in May, according to National Industrial Conference Board.—Page 96.

Wagner Act and Labor Board will be investigated by Congress if Smith resolution, reported favorably, is passed.—Page 96.

Capital goods activity up 13 per cent in June to highest monthly average since March.—Page 110.

Spain to buy 22 ships; German yards filled.—Page 113.

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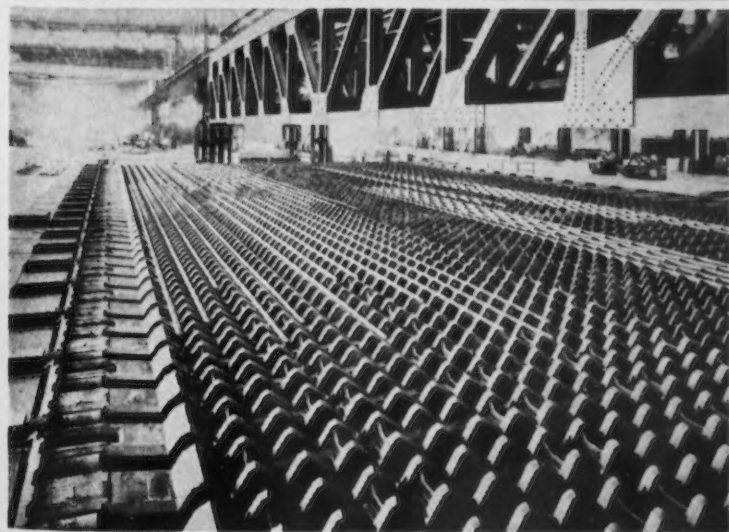
## MEETINGS

July 10 to 15—American Society of Mechanical Engineers, San Francisco.
Aug. 28 to 31—American Mining Congress, Salt Lake City.
Sept. 20 to 22—National Industrial Advertisers Association, New York.
Sept. 26 to 29—Association of Iron and Steel Engineers, Pittsburgh.
Oct. 4 to 13—National Machine Tool Builders' Association, Cleveland.
Oct. 5 to 7—Society of Automotive Engineers, aircraft production meeting, Los Angeles.
Oct. 16—Society of Automotive En- gineers, annual dinner, New York.
Oct. 23 to 27—National Metal Con- gress, Chicago.
Nov. 16 and 17—Porcelain Enamel Institute, New York.





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WITH Morgan continuous cooling and automatic carry-over beds on the job, there are no "bottlenecks" to hold up production. Bars and merchant shapes move from hot to cold run-outs in steady progression and in perfect alignment. There are no delays between finish-rolling and shearing, no distortion of material. Cooling is geared to the peak capacity of the mill.

If any of your rolling mill operations are throwing production out of step, refer the problem to Morgan engineers. Their expert knowledge of modern mill practice and their broad experience in levelling out production lags are always at your service. Their carefully considered recommendations are often the first step to lower operation costs and higher profits.

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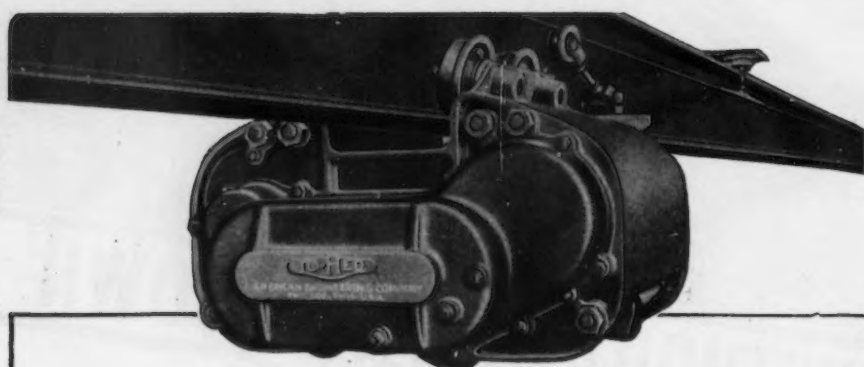
**LET  
REMOVE THE LAGS**



## Armco Starts Work on \$4,500,000 Improvements at Middletown

**M**IDDLETOWN, Ohio—The American Rolling Mill Co.'s open hearth, blooming and bar, and hot strip mill departments closed down July 3 for one of the largest construction jobs ever undertaken in this community, L. F. Reinartz, manager of Armco's Middletown division, announced today.

"Other departments will work as usual since customers' sheet requirements must be met," he said. "For weeks we have been building up a stock of surplus coils and bars from which sheets can be finished and shipped to customers during the shut-down. Of course, other Armco Plants will operate as usual."



### For Short Hauls use the PLAIN TROLLEY TYPE A-E-CO LO-HED HOIST

The plain trolley type A-E-CO Lo-Hed hoist—the one you can pull along the rail—is the sensible choice under these conditions:

1. When the haul is short and the load not too heavy. 2. When the path under the hoist is walkable. 3. When the haul is long but seldom repeated. 4. When time is no great factor. For details of this and all other Lo-Hed hoists, send for our new catalog today.



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PRODUCTS: Taylor  
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- Lo-Heds range from ¼ to 12 ton capacities. (Above type available from ¼ to 6 tons.)
  - Operates on Standard I-beams or track of any make.
  - Low headroom—stacks materials higher than any other hoist.
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  - Compact, strong, simply constructed.
  - Exceptionally low maintenance.
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  - Heavy duty, ball-bearing HOIST motor.
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  - Ball or roller bearings at vital points.
  - Improved plow-steel cable.
  - 100% positive automatic stop.
  - Efficient spur-gear drive . . . and
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Lo-Hed  
HOISTS**

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The construction job, which involves an expenditure of about \$4,500,000 will be rushed through with all possible speed by the F. H. McGraw Co., general contractor. Engineers estimate a month will be required to complete the work. Crews of workmen will work three 8-hr. day and night shifts continuously to get the plant back in running order at the earliest possible moment. About 1200 men will work on the job. The majority of these are Armco men from other departments. The crews were all organized and ready to go when the mill shut down. In fact, several hundred men have been working for weeks past, getting just as much of the project done as possible without interfering with mill operations.

Plans provide for the replacement of the present steam-driven blooming mill with a modern slabbing mill driven by two 5000-hp. motors. The hot strip mill will also be revamped and widened. These improvements will make it possible to roll an entire 17,000-lb. ingot at one time into a wide coil of steel a quarter-mile long.

This job represents the final step in the plant modernization and improvement program started by the American Rolling Mill Co. in 1937.

## Iron, Steel Carloadings Expected to Be Higher

**W**ASHINGTON—The Shippers' Advisory Boards of the Association of American Railroads have estimated that shipments of iron and steel in the third quarter of 1939 will total 309,022 carloads, a 24.1 per cent increase over similar shipments of 248,928 carloads in the corresponding quarter of last year.

Estimated shipments of ore and concentrates are 546,731 carloads, an increase of 74.6 per cent over the shipments of 313,132 carloads in the third quarter of 1938. Machinery and boiler shipments for the third quarter of the current year are estimated at 23,883 carloads compared with 21,439 in the corresponding quarter of last year.

T. B. Wood's Sons Co., Chambersburg, Pa., has appointed the Hartley-Rose Belting Co., Pittsburgh, as its representative in the greater Pittsburgh industrial area. The company's stock of transmission machinery will be carried by the Hartley-Rose company.

The American Brass & Copper Co., wholesaler of metals, has moved to 73 Warren Street, New York.

## Federal Agencies Shifted; John M. Carmody Heads PWA-WPA

WASHINGTON — The President's plan to reshuffle Federal agencies, expected to save in the neighborhood of \$20,000,000 annually, according to the Administration, went into effect last Saturday as the Government entered its new fiscal year with the New Deal's second largest deficit and a record public debt about \$3,500,000,000 more than it was a year ago.

Under the reorganization plan, John M. Carmody, administrator of the new Federal Works Agency, becomes boss of the PWA (which was torn from Interior Secretary Ickes), of the WPA whose reputation has been so tainted that Congress has curbed its functions, and of the public buildings branch of the Treasury Department and the Bureau of Public Roads.

Thus the way was made clear for inauguration of the proposed new \$3,860,000,000 spend-lend program much of which, if approved, will be carried on under Mr. Carmody's direction. The new administrator said at a press conference on Thursday that he believed it was possible for the Government to let industry know what it plans to do so that industry "can plan on the business it is to get." It was his opinion that industry would be the first to feel any curtailment of Government spending and would "ask for some sort of aid."

"There is nothing in this program as I see it that interferes with private industry's own plans for building," Mr. Carmody said of the new program. "There are scores of men in industry concerned about keeping their own plants modern. Everything spent gives industry a chance to take the part it can save and put it into its own plants."

He also disclosed that Col. F. C. Harrington, who succeeded Harry L. Hopkins as WPA administrator will remain as head of the relief set-up—an announcement which was regarded by some observers as an answer to criticism of the WPA administrator. The Bureau of Public Roads and Treasury's public building branch are expected to undergo little change in the consolidation move.

Referring to the 2800 PWA projects which have been approved but held up because of lack of money, Mr. Carmody asserted these projects will have to be reviewed if Congress passes President Roosevelt's sugges-

tion and approves only "self-liquidating" projects. It is Mr. Carmody's present plan, he said, to speed these PWA projects whenever the money is forthcoming.

While Interior Secretary Ickes was shorn of his Public Works Adminis-

tration, an adjunct which has been as close to his heart as of any of his numerous other duties, he became the new soft coal czar when the functions of the National Bituminous Coal Commission were transferred to his department under the reorganization procedure. The coal commission, which, after more than three years, has been unable to fix prices on bituminous coal as stipulated in the coal law, passes out of existence.

### Improvements in the Engineering and Design of Fuel Oil Systems NOW PERMIT YOU TO SWITCH TO THE ECONOMIES OF HEAVY OILS

**T**O satisfactorily utilize all of the combustibles in the lower priced low grades of heavy oils has been a stumbling block.

With the importance of the fuel problem in mind "Salem" engineers made an intensive study of ways and means to make the heavy oils practical for metal heating and treating furnaces.

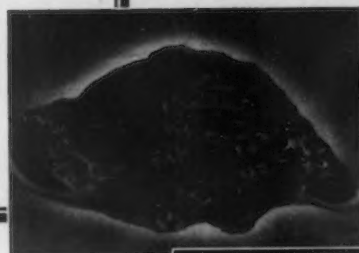
The result is that today "Salem" is able to offer systems for burning the heavy oils economically, without shutdowns due to clogged lines or valves, and with all of the control possible with gas or other fuels.

Two features of the "Salem" method are controlled force feed circulation and proper equipment to break down and keep in free circulation the solids and semi-solids common to the heavy oils. By breaking these solids down into sufficiently minute particles, ready combustion, uniform firing and the elimination of line troubles are achieved.

*If you are located where oil shipments may offer economies over other fuels why not call in a qualified "Salem" representative—who will be glad to discuss the potentials with you—or avail yourself of the offer at the right.*

#### COMPARE:

This sludge from low cost, heavy fuel oil, with high B.T.U. value, approx. 180,000 B.T.U. per gal. is utilized by "Salem" equipment.



A laboratory sample of lighter fuel oil—which costs more and offers only 140,000 to 160,000 B.T.U. per gallon.



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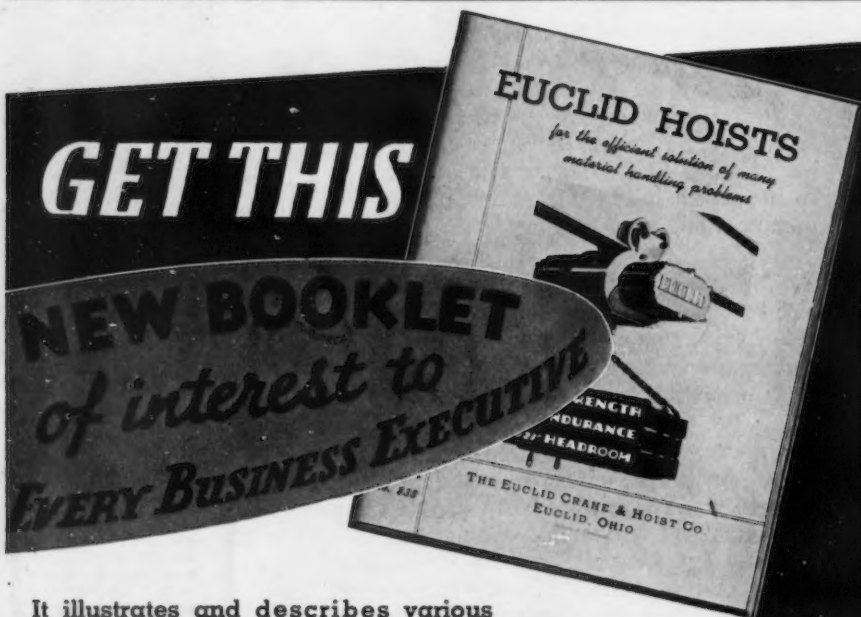


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## President Roosevelt Signs New Tax Bill

**W**ASHINGTON—After affixing his signature to the new tax bill, which terminates the controversial undistributed profits tax, President Roosevelt declined comment on the measure last week except to say that it presents several administrative problems on which the Treasury Department is now working. He turned aside questions as to what effect the new law would have on business, insisting that he had no information one way or the other as to whether it would stimulate business.

The new measure, which becomes the Revenue Act of 1940, strikes out the remaining remnant of the undistributed profits tax and substitutes a flat 18 per cent income levy on corporations earning more than \$25,000 a year. It was designed to remove tax "irritants" and help speed business recovery but it was only in recent months that there were indications that President Roosevelt might change his attitude on the undistributed profits tax and sign the measure.

This change of attitude came, however, after members of the Senate Finance Committee threatened to take matters in their own hands to stimulate business through a new tax bill. At this juncture, the President relaxed his former position, announcing that he had no objection to eliminating the undivided profits tax if other ways of making up the tax loss were found and if no new loopholes were opened up for tax avoidance.

While he declined comment on the new revenue law, Mr. Roosevelt talked freely on a suggested income tax based on gross earnings in lieu of the present system of taxing net incomes. He expressed himself as opposed to any gross earnings tax and reminded his questioner that it might work hardship on persons in the low income brackets.

The White House has recently announced that the income tax base should be broadened but that little could be expected in additional revenue because of the difficulties involved in collecting the tax. The gross income tax was put forward at a press conference by one reporter who said that the tax could be more easily collected but Mr. Roosevelt did not comment on this phase of the inquiry.

Quaker City Rubber Co., Philadelphia, has opened a new branch at 201 San Jacinto Street, Houston, Tex., in charge of H. M. Sossaman. A warehouse stock of belting, hose, packing and other mechanical rubber goods will be carried.



## REINFORCING STEEL

... Awards of 9800 tons; 7700 tons in new projects.

### ATLANTIC STATES AWARDS

- 1300 Tons, Hartford, Conn., dike, to Truscon Steel Co.  
1000 Tons, Union, Conn., bridge, to Truscon Steel Co., through A. I. Savin Construction Co., contractors.  
775 Tons, Quincy, Mass., soap factory for Procter & Gamble Co., to Truscon Steel Co., through James Stewart & Co., N. Y.  
480 Tons, Franklin County, Pa., highway project, section 18, to Bethlehem Steel Co., Bethlehem, Pa.  
400 Tons, Buffalo, municipal auditorium, to Truscon Steel Co., Buffalo.  
295 Tons, Westmoreland County, Pa., section 2, Pennsylvania Turnpike Commission, to Jones & Laughlin Steel Corp., through Electric Welding Co.; McCrady-Rogers Co., contractor.  
260 Tons, Winchester, Conn., two bridges to an unnamed company; Oneglia & Garvesini, Inc., Torrington, Conn., contractor.  
250 Tons, Newtonville, Mass., telephone exchange, to Truscon Steel Co.  
220 Tons, East Hartford, Conn., dike, to Truscon Steel Co., M. A. Gammine Construction Co., Providence, R. I., contractor.  
175 Tons, Westmoreland County, Pa., sections 5 and 6, Pennsylvania Turnpike Commission, to Jones & Laughlin Steel Corp., through George Vang, Inc.  
100 Tons, Stratford, Conn., road and bridge placed privately, Peter Mitchel, Inc., Greenwich, Conn., contractor.

### CENTRAL AND WESTERN STATES

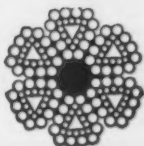
- 1955 Tons, Memphis, Tenn., housing project, to Jones & Laughlin Steel Corp., Pittsburgh, through S. & W. Construction Co., Memphis, Tenn., general contractor.  
1050 Tons, Cleveland, Woodhill housing project, to Paterson-Leitch Co., Cleveland, through Hunkin-Conkey Construction Co., Cleveland.  
750 Tons, Seattle, Ballard bridge approach, to Northwest Steel Rolling Mills, Seattle.  
600 Tons, Waterloo, Iowa, sewage disposal plant, to Truscon Steel Co., through Dobson-Robinson Co., Lincoln, Neb., general contractor.  
170 Tons, Holland, Mich., power plant to Calumet Steel Co., Chicago.  
158 Tons, San Francisco, underpass on Golden Gate bridge approach, to Truscon Steel Co., San Francisco, through M. J. Lynch, San Francisco, contractor.

### PENDING REINFORCING BAR PROJECTS ATLANTIC STATES

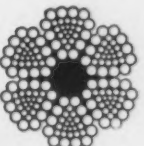
- 823 Tons, Bedford County, Pa., section 12A, Pennsylvania Turnpike.  
400 Tons, Springfield, Mass., sewage plant, cont. No. 5; bids July 13.  
305 Tons, Onondaga and Madison Counties, N. Y., mesh, highway project R.C. 4019; bids close July 26.  
200 Tons, New York, Cross Island Parkway, MC-3916.  
197 Tons, Dutchess County, N. Y., mostly mesh, highway project No. R.C. 4016, John Arborio, Inc., Poughkeepsie, N. Y., low bidder. (Previously awarded.)  
183 Tons, Schoharie County, N. Y., mostly mesh, highway project R.C. 4022, Madison County Construction Co., Madison, N. Y., low bidder. (Previously awarded.)  
110 Tons, Otsego and Schoharie Counties, N. Y., including 50 tons structural steel highway project S.S. 39-7; bids until July 26.

### CENTRAL AND WESTERN STATES

- 3700 Tons, Chicago, State Street subway, bids extended to July 9.  
1400 Tons, University City, Mo., River Des Peres drainage works; Fred Schmitt Contracting Co., St. Louis, general contractor, with a low bid of \$739,321, subject to approval of PWA.  
1300 Tons, Cleveland, substructure, Columbus Road bridge; bids July 13.  
875 Tons, Millwood, Okla., Great Salt Lake Dam, Mitty Bros. Construction Co., Los Angeles, Cal., low bidder on general contract.  
650 Tons, Danville, Ky., State hospital and clinic.  
525 Tons, Evanston, Ill., dormitory, Northwestern University.  
300 Tons, Los Altos, Cal., cement plant; bids being taken.  
225 Tons, Gary, Ind., pump and blower house.  
225 Tons, Chicago, Brach Candy Co. plant.  
200 Tons, Minneapolis, Atchison Elevator Co. factory.  
100 Tons, San Francisco, Horace Mann Junior High School; Alfred Fisher, San Francisco, low on general contract.



Style B  
Flattened Strand



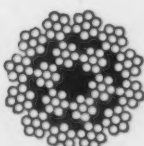
"B"  
Flattened Strand



Wire Rope Center



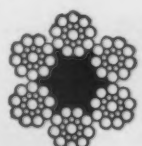
Steel Clad



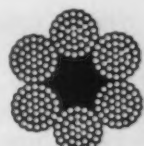
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## Wagner Act and Labor Board May Be Investigated by Congress

WASHINGTON — What the National Labor Relations Board has been fearing most—a Congressional investigation of its activities—was given the right-of-way by the House Rules Committee late last week when the committee in a seven to four vote decided to report

favorably on the Smith resolution. It was the committee's answer to charges that the House Labor Committee has been stalling on proposed amendments to the Wagner Act.

The resolution, which stands a good chance of being passed by the House where conservative Democrats and

Republicans are expected to vote for passage, would empower a five-man committee to report findings on (1) the increase or decrease in strikes and labor disputes since the board began functioning; (2) whether amendments to the Wagner Act are needed; (3) whether the board has been biased toward one labor group or another and whether it has consistently refused to recognize any rights of the employer; and (4) whether the board has been fair and impartial, what effect its rules and regulations have had and whether Congress should redefine the term interstate commerce to delineate more clearly the board's scope of authority.

The resolution was introduced in the House by Representative Howard W. Smith, of Virginia.

The Labor Board also was faced last week with the job of deciding which faction in the automobile unions should be recognized by employers. T. R. Iserman, counsel for the Chrysler Corp. told the board his company was confused by the intra-union dispute in the industry but the board reserved its decision.

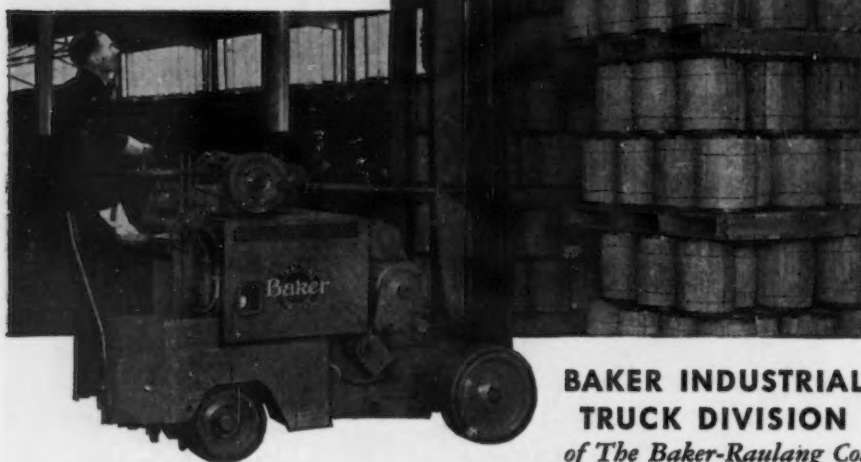
Arguments in the case involved in addition to the Chrysler Corp., the Briggs Mfg. Co., and the Motor Products Corp.

## BAKER telescoping Fork Truck TRIPLES STORAGE SPACE

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foot of floor space

A large nail mill needed more storage space. This BAKER Fork Truck provided it without adding to overhead, by making accessible every foot of space from floor to ceiling.

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TRUCKS FOR  
EVERY PURPOSE**

### Unemployment Declined in May, Says Conference Board

UNEMPLOYMENT in the United States declined 2.9 per cent in May, falling below 10,000,000 for the first time since last December, according to the monthly estimate of unemployment and employment prepared by the Division of Industrial Economics of the National Industrial Conference Board.

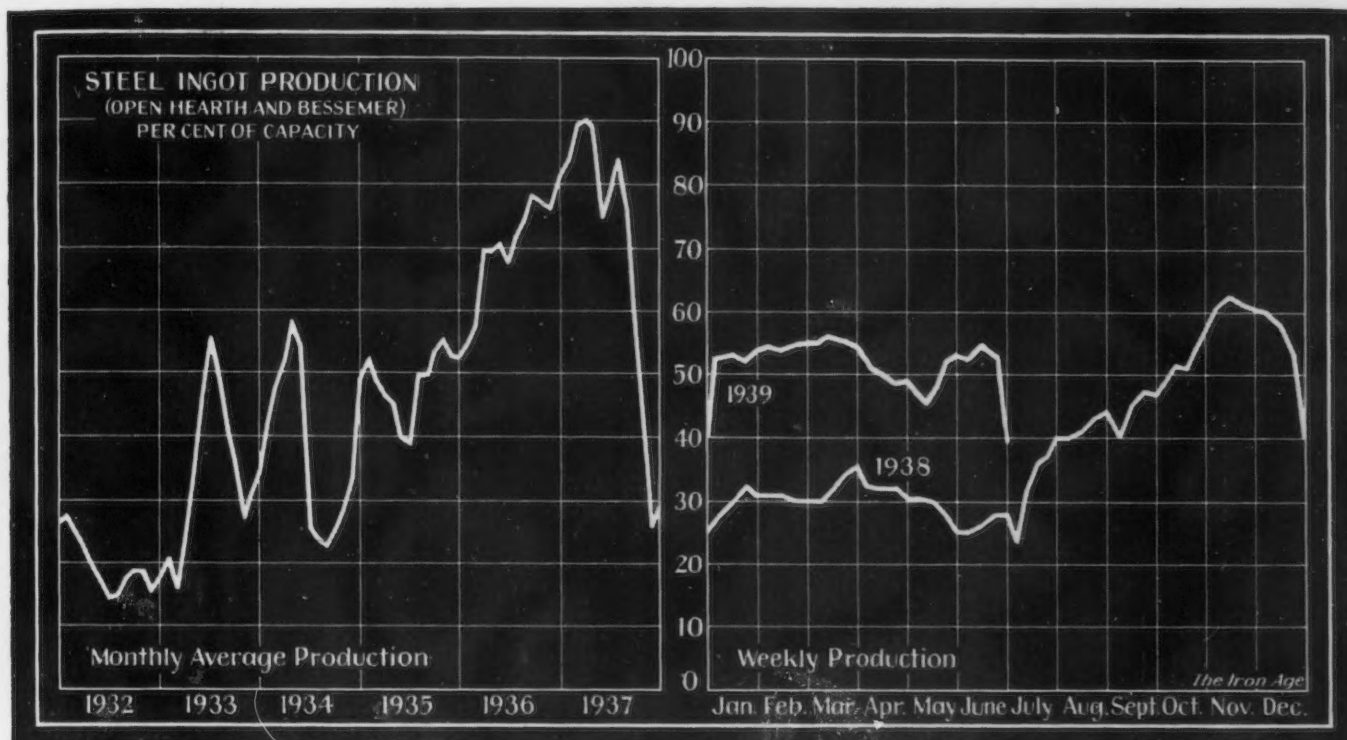
Jobless workers in May numbered 9,881,000 or about the same as in October of last year. This figure shows an improvement of a million and a half from May, 1938, but remains over 4,000,000 greater than that for the third quarter of 1937, low point.

### Equipment Makers Book Heavier Business

THE Link-Belt Co., Chicago, booked more business in May than in any month since October, 1937, and June business was expected to be as good if not better than that of May. For the quarter ended June 30, Allis-Chalmers Mfg. Co., Milwaukee, a week ago was believed to have booked more business than in any similar period since that ended Sept. 30, 1937.

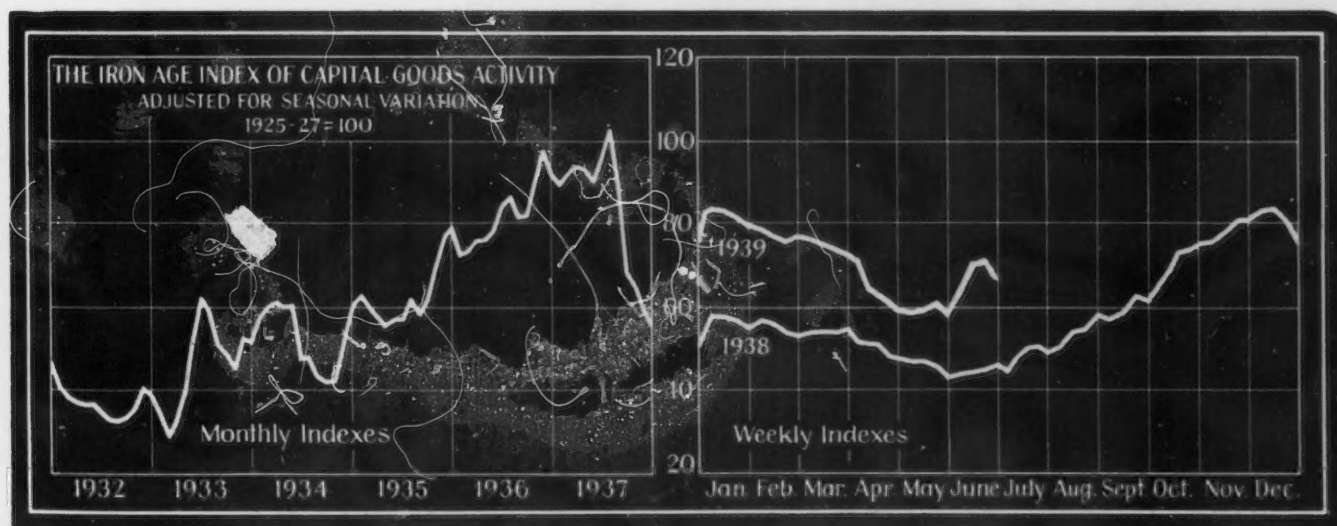


## Ingot Production Down This Week to 40%



District Ingot Production, Per Cent of Capacity	Pittsburgh	Chicago	Valleys	Philadelphia	Cleveland	Buffalo	Wheeling	Detroit	Southern	S. Ohio River	Western	St. Louis	Eastern	Aggregate
CURRENT WEEK..	34.0	44.5	34.0	32.0	26.0	28.0	58.0	40.0	60.0	38.0	35.0	35.0	28.0	40.0
PREVIOUS WEEK..	46.0	51.0	52.0	37.0	49.0	34.0	77.0	55.0	70.0	60.5	45.0	44.0	35.0	54.0

## Index Softens as Auto Output is Drastically Curtailed



A SHARP reduction in automobile assemblies in the past week, signaling the expected approach of the end of the 1939-model season, was responsible for a loss of 1.4 points in THE IRON AGE capital goods index in the week of July 1, bringing the combined index number down to 68.5. This decline followed three consecutive weeks of improvement. The construction series was also lower as awards failed to reach the high levels established earlier in the year. The other three components of the index moved up slightly, however, chiefly on the basis of less-than-seasonal declines in physical volume.

	Week Ended July 1	Week Ended June 24	Comparable Week	
			1938	1939
Steel ingot production <sup>1</sup> .....	81.0	80.7	39.0	137.0
Automobile production <sup>2</sup> .....	65.6	73.9	38.8	135.6
Construction contracts <sup>3</sup> .....	72.1	73.8	57.1	121.8
Forest products carloadings <sup>4</sup> .....	55.3	54.6	48.9	120.7
Production and shipments, Pittsburgh District <sup>5</sup> .....	68.7	66.7	45.6	129.9
Combined index .....	68.5	69.9	45.9	129.0

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.



# ... SUMMARY OF THE WEEK ...

*... Sales of nearly all products gained in June.*

*... Operations off owing to holiday; will rebound next week.*

*... Steel companies continue efforts to improve mill net return.*

**N**EARLY all steel products registered sales gains in June as compared with May, some moderately, others quite substantially. While the importance of this improvement could easily be exaggerated, as May was not a good month owing to the retarding influence of the coal strike and the acute price confusion, it is significant that the gains of the past month have been sufficiently general in character to hold forth promise for the two mid-summer months.

Some of the business of the past two weeks has been "driven in" by withdrawal of price concessions on some products; the arrival of the effective date for the announced price changes on bars, which mean \$1 more a ton to large buyers, and the pressure that some mills are exerting on customers to obtain specifications for sheets and strip against recent low-priced commitments. Although these specifications were of help in boosting aggregate steel business in June, they were much smaller than expected, which points to the probability of an increase in these orders during July and August.

Such gains as were made in sales last month were without substantial aid from the automobile industry, the railroads or the farm machinery industry, which together normally account for nearly a third of all steel consumption. Some of the farm machinery plants have resumed production after vacation shutdowns, and the automobile industry is expected to return to the market with volume requirements not later than early August.

**W**HILE it is clearly out of the question for steel companies to raise prices at this juncture, there is a widespread determination to improve the mill net return by the elimination of concessions and practices that have adversely affected net returns. As this change of policy really dates from July 1, and as many buyers have taken advantage of the concessions that were held open to them before that date, it may be at least two or three weeks before the full effect on the price situation is discernible.

The elimination of abuses that have grown up

under the former system of quoting plates and shapes to fabricators on fabrication-in-transit projects is one move that is growing. Pipe makers have raised the less-carload, out-of-stock prices on oil country goods to 10.6 per cent above the carload price instead of 5 per cent as formerly. Carbon bar prices are being firmly quoted on the new basis despite the extreme pressure from large bar buyers for a readjustment in their favor.

**A**LTHOUGH steel ingot production this week has dropped sharply owing to holiday shutdowns and, in a few cases, to mass vacations, many units will be operating late this week and next week on a higher basis, which may cause next week's rate to exceed the 54 per cent average that prevailed in the pre-holiday week. Owing to variations in the period of plant idleness over the holiday, the average rate for this week is difficult to estimate accurately, but is around 40 per cent. Some steel-making departments were shut down two or three days, others for only 24 hours. Indicative of an expected improvement in steel production is the fact that two blast furnaces in the Valleys are being put into service. Pig iron production figures for June, to be published next week, will undoubtedly record an increase over May.

**S**TEEL scrap markets are standing by to await developments in the business outlook. While purchases by steel mills have been few in the past week, there has been no weakness in prices, which in all districts remain virtually unchanged. THE IRON AGE scrap composite price is at \$14.71 for the second week.

Fabricated structural steel awards in the week totaled more than 21,000 tons, a fairly good record considering the holiday influence. Lettings of reinforcing bars were 9800 tons.

Railroad equipment purchases are confined to a few locomotives. Large-scale buying is not expected this summer unless Congress passes railroad aid legislation that will encourage the carriers to borrow money on liberal terms. This is a doubtful outlook, however, as the roads are generally averse to creating new debt without increases in revenues.

Shipbuilding activities are to be increased by the construction of 18 ships by the Maritime Commission for the Lykes Brothers Steamship Co., New York. Ten of these boats will be awarded before Sept. 1.

Abroad steel production continues at a high level despite international tension. British mills are so busy that makers are discouraging further heavy commitments.

# A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Rails and Semi-finished Steel

Per Gross Ton:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Rails, heavy, at mill	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	34.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	34.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	34.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	40.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	43.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	1.90

## Finished Steel

Cents Per Lb.:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.15	2.15	2.15	2.25
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	**2.10	2.10	2.10	2.10
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	**2.10	2.10	2.10	2.10
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.65	2.65	2.65	2.70
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.70	2.70	2.70	2.80
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.00	2.00	2.00	2.15
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.80	2.80	2.80	2.95
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.50
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.00	2.00	2.00	2.15
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.05	3.05	3.05	3.20

\*\*Subject to concessions in some districts.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.45
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.60
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	†3.30	3.30	3.30	3.20
Tin plate, 100 lb. base box: Pittsburgh and Gary	\$5.00	\$5.00	\$5.00	†\$5.35

\*Pittsburgh prices only.

†Applies to 80-rod spools only.

‡Subject to post-season adjustment.

## Pig Iron

Per Gross Ton:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
No. 2 fdy., Philadelphia	\$22.84	\$22.84	\$22.84	\$21.84
No. 2, Valley furnace	21.00	21.00	21.00	20.00
No. 2, Southern Cln'tl.	21.06	21.06	21.06	20.16
No. 2, Birmingham	17.38	17.38	17.38	16.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	20.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	21.34
Basic, Valley furnace	20.50	20.50	20.50	19.50
Malleable, Chicago†	21.00	21.00	21.00	20.00
Malleable, Valley	21.00	21.00	21.00	20.00
L. S. charcoal, Chicago	28.34	28.34	28.34	28.34
Ferromanganese, seab'd carlots	80.00	80.00	80.00	92.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

## Scrap

Per Gross Ton:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Heavy melting steel, P'gh	\$15.25	\$15.25	\$14.75	\$13.25
Heavy melting steel, Phila.	15.50	15.50	15.25	13.25
Heavy melting steel, Ch'go.	13.375	13.375	13.75	11.25
Carwheels, Chicago	12.75	12.75	12.75	12.50
Carwheels, Philadelphia	16.00	16.00	16.00	14.75
No. 1 cast, Pittsburgh	15.25	15.25	15.25	14.25
No. 1 cast, Philadelphia	16.25	16.25	16.25	15.25
No. 1 cast, Ch'go (net ton)	12.25	12.25	12.25	11.25

## Coke, Connellsville

Per Net Ton at Oven:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Furnace coke, prompt	\$3.75	\$3.75	\$3.75	\$3.75
Foundry coke, prompt	4.75	4.75	4.75	4.75

## Non-Ferrous Metals

Cents per Lb. to Large Buyers:	July 3, 1939	June 27, 1939	June 6, 1939	July 6, *1938
Copper, electrolytic, Conn.	10.00	10.00	10.00	9.75
Copper, lake, New York	10.00	10.00	10.00	9.875
Tin (Straits), New York	\$8.80	49.00	48.75	43.625
Zinc, East St. Louis	4.50	4.50	4.50	4.75
Zinc, New York	4.89	4.89	4.89	5.14
Lead, St. Louis	4.70	4.70	4.60	4.75
Lead, New York	4.85	4.85	4.75	4.90
Antimony (Asiatic), N. Y.	15.00	14.00	14.00	14.00

# The Iron Age Composite Prices

## Finished Steel

	July 3, 1939	One week ago	One month ago	One year ago
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	2.236c. a Lb.	2.236	2.236	2.300
1939.....	2.286c., Jan. 3;	2.236c., May 16		
1938.....	2.512c., May 17;	2.211c., Oct. 18		
1937.....	2.512c., Mar. 9;	2.249c., Jan. 4		
1936.....	2.249c., Dec. 28;	2.016c., Mar. 10		
1935.....	2.062c., Oct. 1;	2.056c., Jan. 8		
1934.....	2.118c., Apr. 24;	1.945c., Jan. 2		
1933.....	1.953c., Oct. 3;	1.792c., May 2		
1932.....	1.915c., Sept. 6;	1.870c., Mar. 15		
1931.....	1.981c., Jan. 13;	1.883c., Dec. 29		
1930.....	2.192c., Jan. 7;	1.962c., Dec. 9		
1929.....	2.223c., Apr. 2;	2.192c., Oct. 29		
1928.....	2.192c., Dec. 11;	2.142c., July 10		

## Pig Iron

	\$20.61 a Gross Ton	July 3, 1939	One week ago	One month ago	One year ago
Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	20.61	20.61	20.61	19.61	
20.61, June 21;	\$19.61, July 6				
23.25, Mar. 9;	20.25, Feb. 16				
19.73, Nov. 24;	18.73, Aug. 11				
18.84, Nov. 5;	17.83, May 14				
17.90, May 1;	16.90, Jan. 27				
16.90, Dec. 5;	15.56, Jan. 3				
14.81, Jan. 5;	13.56, Dec. 6				
15.90, Jan. 6;	14.79, Dec. 15				
18.21, Jan. 7;	15.90, Dec. 16				
18.71, May 14;	18.21, Dec. 17				
18.59, Nov. 27;	17.04, July 24				

## Steel Scrap

	\$14.71 a Gross Ton	July 3, 1939	One week ago	One month ago	One year ago
Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.	14.71	14.71	14.58	12.58	
15.29, Mar. 28;	\$14.08, May 16				
15.00, Nov. 22;	11.00, June 7				
21.92, Mar. 20;	12.92, Nov. 10				
17.75, Dec. 21;	12.67, June 9				
13.42, Dec. 10;	10.33, Apr. 29				
13.00, Mar. 13;	9.50, Sept. 25				
12.25, Aug. 8;	6.75, Jan. 3				
8.50, Jan. 12;	6.43, July 6				
11.33, Jan. 6;	8.50, Dec. 29				
15.00, Feb. 18;	11.25, Dec. 9				
17.58, Jan. 29;	14.03, Dec. 3				
16.50, Dec. 31;	13.03, July 9				



# ... THIS WEEK'S MARKET NEWS ...

## PRICES

*... Efforts to firm up quotations being extended*

**P**PRICE developments at the beginning of the third quarter may be summed up as follows:

An apparently determined effort to stiffen quotations of plates is being made, some mills having instructed their sales offices to consider no business at less than 2.10c. a lb., basing point.

In connection with these efforts, the revised method of quoting plates and structural shapes on fabrication-in-transit projects, whereby price equalization because of transit disadvantages is to be billed as a separate item, appears to be gaining headway, and may be adopted by a number of mills.

July 31 appears to be the generally accepted deadline for shipment of bars taken at the old 2.25c. base minus quantity discounts. A certain amount of looseness immediately following the date for the new price to go into effect (July 1) is to be expected, but mills state that their quotations will be firm on the new basis.

Establishment of a LOS ANGELES mill base on oil country casing and tubing has been announced. Less-than-carload out-of-stock prices on oil country goods have been raised to 10.6 per cent above the carload price instead of 5 per cent as formerly.

## STEEL OPERATIONS

*... Rate for industry this week estimated at 40%*

**B**ECAUSE of variations in the periods of idleness over the Fourth of July holiday, the average rate of operation for the steel industry this week is somewhat difficult to figure accurately. THE IRON AGE estimate is 40 per cent, but American Iron and Steel Institute on Monday reported an estimate of 38½ per cent.

Some plants were shut down from Saturday night until Tuesday night or Wednesday morning, others only for 24 hours.

Based on a normal week's capacity, steel production this week at PITTSBURGH was figured at 34 per cent,

down 12 points from last week. Factors accounting for this drop are one and two-day shutdowns and a few cases where weekly schedules are being affected by mass vacations. The WHEELING-WEIRTON district is down 19 points to 58 per cent, due mostly to holiday influences, but also to the taking off of a bessemer converter.

CHICAGO mills are operating at an average of 44½ per cent, off six and a half points from last week, but it is expected there that when all steel-making units are running again last week's rate of 51 per cent will be exceeded.

YOUNGSTOWN operations are down 18 points to 34 per cent, while the CLEVELAND-LORAIN rate dropped 23 points to 26 per cent.

In SOUTHERN OHIO the rate will be lowered all of this month owing to the shutting down of the open hearth department at the Middletown plant of the American Rolling Mill Co. for installation of a new blooming mill and other improvements, which will be rushed to completion. The company has provided itself with a substantial stock of semi-finished steel to take care of the orders during the month.

In EASTERN PENNSYLVANIA operations are somewhat better, but owing to the holiday this will not be fully reflected until next week's rate is estimated. The Lukens Steel Co. and the Alan Wood Steel Co. have each put on another open hearth. The holiday shutdown in that district was generally limited to 24 hours.

## NEW BUSINESS

*... Orders for Steel products higher in June than in May*

**T**OTAL steel business booked at PITTSBURGH in June ranged from 5 to 15 per cent ahead of the May volume. This showing is considered satisfactory by producers, especially in view of usual seasonal let-downs during the summer months. A major portion of the improvement has been credited to sheet and strip specifications and hot rolled bar sales, although the basic factor contributing to the maintenance of a steady rate has been heavy structural specifications. Although the past week's business has

been influenced somewhat by the extended holiday period, a fairly quick comeback is expected.

June business exceeded expectations at CLEVELAND and YOUNGSTOWN in all principal divisions of the steel industry, where declines from May had been expected. Resistance against summer seasonal influences was stubborn. Orders for steel plates, carbon bars, nails and barbed wire, warehouse items, bolt and nuts, and merchant pipe were well ahead of the May tonnage volume. In most of these items producers have announced determination to firm up published prices. June rolling orders for sheets and strip were about even with those of the previous month. Enough impetus is thus provided at CLEVELAND and YOUNGSTOWN to carry partly through the current period of slack buying.

Effective July 1, a substantial national plumbing account was transferred to a steel producer with headquarters at CLEVELAND, it is understood.

The CLEVELAND market hears that negotiations are progressing rapidly for the sale of about 10,000 four-wheel drive trucks for France by one of the major Michigan truck companies.

Plants feeding parts to the automobile industry are more active on 1940 model production. In one or two cases, stocks of unsold 1939 automobiles may delay introduction of the newer models by automobile manufacturers.

New business in CHICAGO during June was about the same as the previous month to slightly less. Chief interest during the period was exhibited by the so-called miscellaneous industries, since the automobile makers, railroads and farm equipment plants were relatively inactive buyers. Heavy releases against low-priced sheets and strip are not expected at CHICAGO until nearly the end of July, when motor car plants should be starting their 1940 model runs.

Active buying of plates for pipe lines has been reported recently, and several lines are in prospect for later in the summer.

Farm equipment plants in the CHICAGO district that shut down the last two weeks of June are operating again.

New bookings in PHILADELPHIA



are holding close to the May level, supported by broad miscellaneous demand. Shapes, reinforcing bars and tin plate are currently the most active items, but the demand for standard pipe from jobbers has lately been showing signs of broadening. Automobile buying has been conspicuous by its absence and is not expected in any volume until at least the end of July.

NEW YORK bookings have been fairly satisfactory, late June business having been better than some of the steel companies expected. Specifications against recent low-priced commitments for sheets and strip have not been as large a factor in this result as it was believed they would be. Some offices report that their customers are slow in specifying.

## PIG IRON

*... June shipments generally below those of May ... Sales light*

EARLY weeks of July apparently will be slow for pig iron producers as a whole. Both orders and shipments are expected to be influenced to some extent during the early part of this month by plant shutdowns occasioned by the holiday, vacations and seasonal factors. An improvement in the latter part of the month is expected in the MIDDLE WEST when agricultural machinery and motor car plants resume activity following inventory and changeover shutdowns. Melting operations in the PHILADELPHIA area continue to show a gradual improvement, however, and shipments against old contracts are showing a corresponding bulge. New business generally is on a spot basis, although some third quarter contracts have been reported, but nothing in large amounts.

The trend in June shipments was spotty. At CLEVELAND June shipments fell below those of May, but the decline was not as drastic as many producers expected. At BIRMINGHAM there was a sag the latter part of the month due to mid-year inventories and the holiday. Shipments of pig iron in the CHICAGO area in June were about 25 per cent behind those of the previous month. Up until the beginning of the holiday week end sales at PITTSBURGH were in about the same volume as in the previous week, with shipments during June having registered little or no difference from the May level. In the NEW YORK district, pressure for prompt shipment increased somewhat last week, indicating that inventories at some foundries were at

bottom. Only in the SOUTHERN OHIO district were June shipments of pig iron much better than those of May. Foundry operations remain unchanged there, although the holiday shutdown of most of the melters reduced the week's average sharply. Machine tool and stove foundries continue to be the most active. At ST. LOUIS shipments in June were below those of May, but the past week was the best of the month.

In NORTHERN OHIO, motor car and agricultural implement factories are inactive at present, and conditions among other foundries are spotty. A few jobbing foundries remain active and the electrical industry appears to be producing well. In NEW ENGLAND foundries operating more than three days a week are rare, the average operations being two days or less.

Orders amounting in the aggregate to about 1000 tons were placed through Scandinavian sources during the past week, and new inquiries for lesser amounts appeared from the same source.

## IRON ORE

*... Movement to July 1 is 115% over last year*

SHIPMENTS of iron ore from upper Lake ports during June totaled 5,572,998 gross tons against 3,601,453 tons carried in May and 2,735,253 tons in June, 1938, according to the report of the Lake Superior Iron Ore Association, Cleveland. The cumulative total for the current season to July 1 was 9,231,249 gross tons, against only 4,278,962 in the comparable period last year, an increase this year of around 115 per cent.

## RAILROAD BUYING

*... Orders placed for several locomotives*

ORDERS for diesel-electric locomotives have been placed with Electro-Motive Corp. by the following railroads: Kansas City Southern, one 1000-hp. switching engine; Phelps Dodge Corp., one 600-hp. locomotive, and Florida East Coast, two 2000-hp. locomotives for passenger service.

Green Bay & Western has placed an order for three Mikado-type passenger-freight locomotives with American Locomotive Co.

The Milwaukee Road, which is currently engaged in building 1000 box cars, will construct an additional 83 cars. No railroad buying of impor-

tance is in prospect for the rest of the summer unless the Government plan for financing the building of new equipment is adopted.

The Federal Court at ST. LOUIS has authorized the St. Louis Southwestern Railway to purchase and install approximately 20 miles of 112-lb. rails for main line tracks between Bests and Camden, Ark., at a total cost of \$342,392.

## WAREHOUSE BUSINESS

*... Orders show rise at the end of June*

CHICAGO warehouses report an unusually busy final week in June, which is due in their opinion to cleaning up on the part of a number of local plants that plan to shut down all of this week. The month of June as a whole compared favorably with May but orders during July and August are expected to show declines. There is hope, however, that activity from Detroit will have a beneficial affect on the August total. Demand from warehouses is broad and well diversified.

June was 10 to 15 per cent better than May in warehouse volume at CLEVELAND. The last week of the month exceeded expectations in numerical volume and tonnage of orders. To what the rise was attributable is a question, unless the price changes at the end of May were responsible for driving an increased volume of bar business to warehouses.

Warehouse sales in PHILADELPHIA in June were characterized by wide diversification but small tonnages per order. In volume, sales were just about equal to the May total. Toward the end of the month the call for tubular goods and black and galvanized sheets improved somewhat, but not sufficiently to have any important influence on the month's total. The recurrent weakness in prices on galvanized sheets was formally acknowledged by leading jobbers in the past week by a reduction of \$3 a ton to a base of 4.28c per lb. on 10 bundles or over. Earlier in the month cold-finished bars were cut \$1 a ton to conform with the recent reduction in mill prices.

BUFFALO warehouse operators report that June business varied little from that of the preceding month. Some lines show slight improvements.

Warehouse business in ST. LOUIS in June showed a slight improvement over the preceding month, with hot

rolled sheets and plates, bars and structural shapes in best demand. Business from the Illinois oil fields is disappointing, as most of the equipment is being moved in from Oklahoma and Kansas.

Although the number of orders placed with warehouses in the NEW YORK area in June showed a gain over the previous month, the aggregate tonnage involved was slightly below the May level. Flat-rolled steel accounted for the bulk of the month's business, with the demand for heavy products extremely light. A further recession is expected in July, usually the poorest month of the year, with August heralding the seasonal fall upswing. Quantity extras on cold-finished carbon bars on lots under 300 lb. of a size were revised on July 1 from \$1.50 to \$2 a ton, in conformity with recent mill action.

### SEMI-FINISHED STEEL

*... Sales at Pittsburgh gained in June*

**T**OTAL semi-finished sales in the PITTSBURGH district during June were slightly ahead of the volume booked in May. Movement of sheet bars to non-integrated mills is expected to be steady within the next few months as it will be closely attuned to the volume of incoming flat rolled specifications. Re-rolling billets and tube rounds have been moving at a little better pace recently, with the latter product reflecting a slightly better one in tubular sales volume.

June at CLEVELAND ended with aggregate semi-finished sales for the month approximately equal to May.

### PLATES

*... Mills endeavoring to improve their net return*

**P**RODUCERS of plates are continuing an apparently determined effort to improve their mill net return. The simplified plan of quoting on fabrication-in-transit projects, whereby mills will take into consideration the location of mills capable of producing the same sizes and gages and will then make an allowance to equalize the freight between fabricator's shop and point of ultimate destination, has not yet been seriously tested, but may be within the next few weeks as additional mills decide to follow this procedure.

While a considerable volume of business has recently been placed with mills at an f.o.b. price of 2.00c., a concession of \$2 a ton, it is said that a number of producers have notified all sales offices to quote 2.10c. as a firm price henceforth, subject only to such allowances as are made to meet competition from other basing points.

Specifications for plates in June at CLEVELAND were about 15 per cent larger than those of May.

The Chester, Pa., shipyard released several lots of plates in the past week and the Pennsylvania railroad placed part of its requirements for a locomotive tender program being carried out in its own shops.

The A. O. Smith Co., Milwaukee, has received an order for a 66-mile, 16-in. natural gas line from the El Paso Natural Gas Co., to be laid in New Mexico. More than 8000 tons of plates were required for the line, shipments of which were scheduled to begin July 6. Over 11,000 tons of plates will be needed for a 180-mile, 8-in. gasoline pipe line to be built by Standard Oil Co. of Indiana between Kansas City and Council Bluffs, Iowa.

### MERCHANT BARS

*... Mills stick by their guns on recent price change*

**P**RESSURE exerted on bar producers to extend shipments beyond the end of July on bar orders carrying the old price setup has been to no avail. The amount of covering done by large buyers before the first of July in order to save \$1 a ton between the new price and the old setup, was only moderate. It was, however, a factor which contributed to a greater volume of bar sales in June over May bookings. Some of the miscellaneous pickup last month, however, and which to some extent is still continuing, was probably due to more active buying by smaller interests who gained a \$2 a ton advantage in the base rate when the quantity discount method of selling was eliminated. Some of these customers, previous to the change, had been, to some extent, holding back purchases pending price clarification.

Bar orders at PITTSBURGH during June were in excess of 25 per cent over the May volume, with orders emanating from miscellaneous sources.

At CLEVELAND specifications received during June were approximately 25 per cent higher than during May. Shipments are heavy.

This market is quiet in CHICAGO, as motor car makers have not yet started to order for their new model production, and many large agricultural machinery plants are shut down until after the holiday. Coverage at present prices has not been at all heavy, buyers for the most part seeming indifferent. Some pressure already has been reported to extend coverage until the end of the year, but this request was denied, July 30 being the apparent deadline at present for shipment of bar orders taken at the former 2.25c. base minus quantity allowances.

### SHEETS AND STRIP

*... Specifications coming in more slowly than expected*

**A**LTHOUGH sheet and strip specifications at PITTSBURGH have been flowing in at a slower pace than producers had hoped for, bookings in June against previous commitments were substantially ahead of the May volume. The moderate support emanating from miscellaneous sources, which has helped to offset the dullness in automotive purchases, continued last week up to the beginning of the extended holiday period. Although the volume of business is expected to slow up considerably during this week, a quick comeback is expected. Strip steel specifications have stepped up somewhat within the past 10 days as parts makers are more active. Current published prices on sheets and strip remain untested, owing to previous coverages by all important consumers.

Specifications from miscellaneous users held up well at CLEVELAND right up to the end of June, despite the fact that every day sellers expected to see a drop. June rolling orders at CLEVELAND were about even with those of May. Specifications from industries other than automotive field have been most welcome since their release and shipment will help clear the way for automotive orders, which are expected to be heavy.

No appreciable change in the rate at which releases against low-priced commitments are being received is noticeable in CHICAGO. Volume is not great, and probably will not be much larger until the automobile industry orders start coming in for 1940 models. Current specifications emanate from a widely diversified list of manufacturers.



## BOLTS, NUTS, RIVETS

... Orders in June exceeded those of May

**A**GGREGATE June order volume for bolt and nut producers exceeded May, principally due to generous purchases by jobbers toward the close of the month. The rise in volume exceeded expectations and despite the fact the early weeks of July may be slow, the resumption of the automotive industry, coupled with the better price situation, is making producers more optimistic than at any time in months.

## TUBULAR GOODS

... Pipe sales gained moderately in June

**T**OTAL tubular sales in June are estimated to have run from 15 to 17 per cent ahead of May bookings. Oil-country goods specifications at PITTSBURGH registered a mild increase last month over May and a fair pickup in merchant pipe has been noted. Up until the influence of the holiday period became noticeable, this slightly stronger trend in tubular sales was still existent. No unusual activity in oil-country goods demand is expected, however, during the next few months, but on the other hand no significant decline is looked for either.

CLEVELAND reports that establishment of a Los Angeles mill base on oil country goods and casing stands out as the principal news of the week in the tubular market, followed by an increase in less-than-carload out-of-stock oil country goods prices, which are now 10.6 per cent above the carload price instead of 5 per cent as formerly and which will tend to assist direct mill shipments.

Merchant pipe sales by producers with headquarters at CLEVELAND and YOUNGSTOWN showed an increase dur-

ing June from the preceding month. Casing orders held up well also.

## SHIPBUILDING

... Lykes Brothers Steamship Co. to build 18 ships

**T**HE Maritime Commission has completed an agreement with the Lykes Brothers Steamship Co., New York, providing for the construction of 18 new cargo vessels, contracts for 10 of which are to be awarded before Sept. 1. The vessels are to be of the C-1 design and will require 2650 tons of steel each.

On July 2 the commission invited bids for the construction of an undisclosed number of the C-1 ships. These will be opened July 11 and it will be decided at that time, officials said, how many of the ships will be ordered immediately. In any event orders for 10 of the vessels will be placed before Sept. 1.

## WIRE PRODUCTS

... Merchant items in better demand in some districts

**J**UNE volume of merchant wire products exceeded expectations at CLEVELAND and was well ahead of May. Protective orders against producers' attempts to firm up prices were the cause of the tonnage increase. Furthermore, the material has been moving well from jobbers to ultimate consumers. The early weeks of July apparently will be quiet. Sales of manufacturers' wire should become more active in another month, as the auto industry becomes more active, but until that time little can be expected. Export orders, principally from South America, are helping to hold up tonnage volume. Production through June held unusually steady in this district.

Sales of merchant wire products are well sustained in the CHICAGO territory. A large factor is demand for nails and other wire used by the construction industry. Demand for fence has fallen considerably now that farmers are in their fields and a resumption of activity in this product probably will not be seen until fall. No increase in manufacturers' wire sales is expected in that district until local customers supplying the automobile industry receive their first orders on 1940 models.

Although manufacturers' wire demand at PITTSBURGH in June was about on a par with May bookings, sales of merchant wire products dropped somewhat from the May volume. During the closing weeks of June and just preceding the holiday week-end, some of this loss was made up, although the increases during this period were nothing exceptional. Producers look for slow activity during July with seasonal pickup expected in August.

## REINFORCING BARS

... Several projects of good size awarded

**T**RUSCON STEEL CO. shared prominently in the larger awards of the week, being credited with 1300 tons for a dike near Hartford, Conn., 1000 tons for a bridge in Connecticut, 775 tons for a soap factory for the Procter & Gamble Co. at Quincy, Mass., 600 tons for a sewage disposal plant at Waterloo, Iowa, and 400 tons for a municipal auditorium in BUFFALO.

One of the largest recent awards in CLEVELAND is 1050 tons for the Woodhill Homes housing project, which went to the Paterson-Leitch Co.

At SEATTLE, the Northwest Steel (CONTINUED ON PAGE 110)

## Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	July 3, 1939	June 27, 1939	June 6, 1938	July 6, 1938	1939	1938
Fabricated structural steel awards ....	21,250	12,850	21,900	16,855	534,475	357,230
Fabricated plate awards .....	2,380	125	2,990	310	93,355	69,805
Steel sheet piling awards .....	0	2,200	175	12,500	33,155	26,820
Reinforcing bar awards .....	9,800	17,125	7,800	1,425	256,920	122,695
Total Letting of Construction Steel	33,430	32,300	32,865	31,090	917,905	576,550



# IRON AND STEEL SCRAP

*... Most markets quiet at start of holiday week ... Composite unchanged at \$14.71.*

**J**ULY 3—A lull has fallen on the scrap markets throughout the country as mills curtail operations around the holiday. In expectations of the shutdowns, very little mill activity was reported last week either, but sales that were made were generally in line with previously quoted prices. Based on these transactions, prices on No. 1 heavy melting steel are unchanged at Chicago, Pittsburgh and Philadelphia, and the composite price is therefore unchanged from last week, at \$14.71. In fact, there was hardly a change in quotation throughout the country this week. Few signs of weakness have appeared anywhere, however, and the lifting of restrictions on shipments next week should add a note of strength. Even the prospect of a complete month's shutdown of a southern Ohio mill failed to weaken the market in that district.

Export shipments continue to lend strength to the domestic market, particularly at Philadelphia, where the market is firm but untested. The Japanese failed to make their usual month-end purchases in June, following holdups on earlier purchases. Shipments abroad are mostly to Great Britain.

## **Pittsburgh**

Holiday shutdowns in steel mills have had a quieting effect on the scrap market, but No. 1 heavy melting steel remains quotable at \$15 to \$15.50 a ton, unchanged from last week. In the past week a moderate tonnage of this grade was purchased at \$15.25 a ton, while some other consuming points in the district continue to pay at least \$15.50 a ton for No. 1. Brokers buying prices still range between \$14.75 and \$15.25. Renewed activity is expected following the holiday and the closing of railroad lists.

The Pittsburgh & West Virginia Railway Co. has cancelled bids submitted recently for the sale of 1200 hopper cars for scrap purposes and will await improved market conditions before putting them up again. Several months ago this company disposed of 400 hopper cars to a Chicago scrap concern at a reported price of \$240 apiece, with the dismantling taking place at the railroad company's yards.

## **Chicago**

The Chicago scrap market is very quiet this week and very little mill activity of any kind as regards the purchase of scrap has been reported. Heavy melting steel remains at \$13.25 to \$13.50 a gross ton delivered. Steel can be purchased today for not less than \$13.25, and in some

instances \$13.50 must be paid. No railroad lists were sold last week but this week the North Western will take bids on some old material.

## **Philadelphia**

A holiday lull has engulfed the market here, so far as the domestic situation is concerned, but export buying and shipping continues without let-down. There have been no sales of steel making grades to local mills in the past week, but the strength of export buying prices and the recent increases in steel making operations in this district are providing ample support for current domestic prices. The July Pennsylvania Railroad list totals slightly over 27,000 tons, the heaviest monthly list in two years. Largest item on the list is 7000 tons of No. 1 heavy melting scrap.

## **Buffalo**

The market continues dull this week with no activity expected until after the holiday. At that time one of the principal mills in the district will again accept shipments on a limited basis. In view of decreased operations no large sales are apparent in the immediate offing.

## **Cleveland**

Some of the open hearths in this district were shut down from last Friday night until July 5, which meant that shipments reflected the inactivity as early as last Wednesday. Despite the temporary thinness of operations, the underlying scrap market retains strength, due to the fact that offerings of the smaller dealers have been very scarce during the past 10 days.

## **Youngstown**

Activity has been light here during the past week due to observance of the holiday in steel plants. It is probable normalcy will not be regained immediately, but establishment of a trend should be completed before the end of this month. Additional mill buying is expected before long. Except for the Pennsylvania Railroad offerings are light. The New York Central, Pennsylvania and Nickel Plate lists close this week, followed by the B. & O. and the C. & O. The latter offers around 10,000 tons.

## **St. Louis**

An increase of 10c. a ton on No. 2 heavy melting steel is the only holiday change in prices of scrap iron in the St. Louis market. No sales were made during the week to mills in the district, and none is pending. Dealers are trying to cover old contracts, in which there is said to be considerable short interest. Little scrap is coming in from the country. Railroad lists: Pennsylvania, 27,000 tons; New York, Chicago & St. Louis, 2500 tons; Chicago, Burlington & Quincy, 2400 tons; Gulf Coast Lines, 650 tons.

## **Cincinnati**

While the old materials market started during the past week under a slight price weakness, dealer adherence to current quotations removed the softness and the market closed strong. The average picture, therefore, in scrap in southern Ohio shows relatively no change from the preceding period. Although one mill in the area expects no open-hearth operations through the entire month of July, there has yet been no change in the acceptance of scrap on contracts of this interest. The threat to shutdown, however, was used in an effort to obtain better prices on material shipped in, but refusal of the dealers to meet pressure resulted in acceptance of current prices. Dealers' bids are unchanged and dealer activity continues to consist largely in the obtaining of scrap for application against contract.

## **Detroit**

A result of the tapering of automobile production and the holiday influence has been an increase in softness in Detroit scrap circles but so far prices have not been affected. Automotive lists brought quotations in line with recent bids. The most marked change has been a willingness on the part of dealers to let go scrap more readily. Previously, for four or five weeks, many dealers had held on to tonnages and it had been difficult in many instances to buy scrap.

## **New York**

The normal flow of export scrap has been resumed, the bulk of the tonnage going to the United Kingdom. As was expected in some quarters, the Japanese did not make their usual month-end purchases last week. Shipments on some recent business had been held up. Domestic shipments continue at a low level. Buying prices are unchanged.

## **Boston**

An occasional carlot of steel turnings and bundled skeleton is moved to the Pittsburgh district, and small tonnages of machinery and textile cast to a New England foundry, but aside from that the domestic market is quite flat with prices in most instances nominal. However, the market for steel turnings is a little firmer and accounts for the slight increase in movement. The export market continues to monopolize the attention of the scrap trade. Although hampered by the lack of proper handling equipment at the Army Base, exporters have managed to somewhat relieve the congestion there.

## **Toronto**

In the scrap markets business remains spotty and specialized, with prices unchanged. Hamilton mills are furnishing steady demand for steel scrap and there is fair movement against contract, while new contracts now coming up still are held to the 30-day limit and consumers are not increasing their bid prices for materials. Heavy melting steel is the leader in activity and there is growing demand for machinery cast, while stove plate, steel turnings, borings, loose clippings and bushelings are draggy.

# Iron and Steel Scrap Prices

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
Railroad hvy. mltng.	16.00 to 16.50
No. 2 hvy. mltng. steel.	13.50 to 14.00
Scrap rails	16.00 to 16.50
Rails 3 ft. and under.	17.50 to 18.00
Comp. sheet steel	15.00 to 15.50
Hand bundled sheets.	14.00 to 14.50
Hvy. steel axle turn.	13.50 to 14.00
Machine shop turn.	9.00 to 9.50
Short shov. turn.	10.50 to 11.00
Mixed bor. & turn.	8.00 to 9.00
Cast iron borings.	8.00 to 9.00
Cast iron carwheels.	14.50 to 15.00
Hvy. breakable cast.	12.50 to 13.00
No. 1 cupola cast.	15.00 to 15.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	18.00 to 18.50
Rolled steel wheels.	18.00 to 18.50
Low phos. billet crops.	18.50 to 19.00
Low phos. punchings.	17.50 to 18.00
Low phos. plate	16.00 to 17.00

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.50
No. 2 hvy. mltng. steel.	13.00
Hydraulic bund., new.	\$14.50 to 15.00
Hydraulic bund., old.	11.50 to 12.00
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels.	16.00
Hvy. breakable cast.	14.50 to 15.00
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.50 to 16.00
Machine shop turn.	5.30
No. 1 blast furnace.	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings.	10.00 to 10.50
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles.	17.00 to 17.50
Rolled steel wheels.	17.00 to 17.50
Steel axles	20.00 to 20.50
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire.	12.00 to 12.50
Cast boring (chem.)	9.50 to 10.00

## CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	\$13.25 to \$13.50
Auto. hvy. mltng. steel alloy free	11.75 to 12.25
No. 2 auto steel	10.25 to 10.75
Shoveling steel	13.25 to 13.50
Factory bundles	12.25 to 12.75
Dealers' bundles	11.25 to 11.75
Drop forge flashings.	9.25 to 9.75
No. 1 busheling	11.75 to 12.25
No. 2 busheling, old.	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	15.00 to 15.50
Railroad leaf springs.	14.50 to 15.00
Steel coup. & knuckles	14.25 to 14.75
Axle turnings	12.50 to 13.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	13.50 to 14.00
Low phos. punchings.	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	6.50 to 7.00
Short shov. turn.	6.50 to 7.00
Machine shop turn.	6.50 to 7.00
Rerolling rails	18.00 to 18.50
Steel rails under 3 ft.	16.00 to 16.50
Steel rails under 2 ft.	16.50 to 17.00
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Agric. malleable	12.00 to 12.50

Per Net Ton

Iron car axles	\$18.00 to \$13.50
Steel car axles	17.50 to 18.00
Locomotive tires	13.00 to 13.50
Pipes and flues	8.50 to 9.00
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast	12.50 to 13.00
No. 1 railroad cast.	11.00 to 11.50
No. 1 agric. cast	10.00 to 10.50
Stove plate	7.75 to 8.25
Grate bars	7.75 to 8.25
Brake shoes	9.50 to 10.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	14.00 to 14.50
Low phos. plate	16.25 to 16.75
No. 1 busheling	14.25 to 14.75
Hydraulic bundles	14.50 to 15.00
Machine shop turn.	9.00 to 9.50

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	13.00 to 13.50
Comp. sheet steel.	13.50 to 14.00
Light bund. stampings	9.75 to 10.25
Drop forge flashings.	11.50 to 12.00
Machine shop turn.	7.50 to 8.00
Short shov. turn.	8.00 to 8.50
No. 1 busheling	13.00 to 13.50
Steel axle turnings	10.50 to 11.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	8.00 to 8.50
Mixed bor. & turn.	8.00 to 8.50
No. 2 busheling	8.25 to 8.75
No. 1 cupola cast.	15.50 to 16.00
Railroad grate bars.	11.00 to 11.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	17.75 to 18.25
Rails for rolling	17.50 to 18.00
Railroad malleable	15.00 to 15.50
Cast iron carwheels	13.50 to 14.00

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
Railroad hvy. mltng.	13.50 to 14.00
No. 2 hvy. mltng. steel.	11.00 to 11.50
Scrap rails	13.50 to 14.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraulic bundles.	10.00 to 10.50
Drop forge flashings.	11.00 to 11.50
No. 1 busheling	11.00 to 11.50
Machine shop turn.	6.00 to 6.50
Knuckles & couplers.	15.00 to 15.50
Coil & leaf springs.	15.00 to 15.50
Rolled steel wheels.	15.00 to 15.50
Shov. turnings	7.00 to 7.50
Mixed bor. & turn.	7.00 to 7.50
Cast iron borings	7.00 to 7.50
No. 1 machinery cast.	15.00 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels.	13.50 to 14.00
Railroad malleable	15.00 to 15.50

## ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$11.75 to \$12.25
No. 1 hvy. melting.	11.50 to 12.00
No. 2 hvy. melting.	10.50 to 11.00
No. 1 locomotive tires.	12.25 to 12.75
Misc. stand. sec. rails.	12.50 to 13.00
Railroad springs	14.00 to 14.50
Bundled sheets	7.00 to 7.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.	2.50 to 3.00
Machine shop turn.	4.50 to 5.00
Heavy turnings	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Steel car axles	17.00 to 17.50
No. 1 RR. wrought.	9.75 to 10.25
No. 2 RR. wrought.	11.50 to 12.00
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	13.00 to 13.50
Cast iron carwheels.	14.00 to 14.50
No. 1 machinery cast.	14.50 to 15.00
Railroad malleable	12.00 to 12.50
No. 1 railroad cast.	12.00 to 12.50
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

## CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	8.75 to 9.25
Scrap rails for mltng.	14.50 to 15.00
Loose sheet clippings.	6.50 to 7.00
Hydrul. b'ndled sheets	10.50 to 11.00
Cast iron borings	3.25 to 3.75
Machine shop turn.	4.50 to 5.00
No. 1 busheling	7.25 to 7.75
No. 2 busheling	2.25 to 2.75
Rails for rolling	16.50 to 17.00
No. 1 locomotive tires.	13.25 to 13.75
Short rails	17.25 to 17.75
Cast iron carwheels.	12.50 to 13.00
No. 1 machinery cast.	12.00 to 12.50
No. 1 railroad cast.	12.00 to 12.50
Burnt cast	6.25 to 6.75
Stove plate	6.25 to 6.75
Agricul. malleable	10.75 to 11.25
Railroad malleable	13.25 to 13.75
Mixed hvy. cast	10.50 to 11.00

## BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	\$13.00
Scrap steel rails	\$13.50 to 14.00
Short shov. turnings.	7.50
Stove plate	9.50
Steel axles	18.50
Iron axles	18.50
No. 1 RR. wrought.	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast.	15.00
Tramcar wheels	14.50 to 15.00

## DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. in-trial steel	\$10.00 to \$10.50
No. 2 hvy. mltng. steel.	9.00 to 9.50
Borings and turnings.	5.00 to 5.50
Long turnings	4.75 to 5.25
Short shov. turnings.	5.75 to 6.25
No. 1 machinery cast.	12.50 to 13.00
Automotive cast	13.00 to 13.50
Hvy. breakable cast.	9.00 to 9.50
Stove plate	7.75 to 8.25
Hydraul. comp. sheets.	11.25 to 11.75
New factory bushel.	9.50 to 10.00
Sheet clippings	7.25 to 7.75
Flashings	9.50 to 10.00
Low phos. plate scrap.	11.00 to 11.50

## NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$11.00 to \$11.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Hvy. breakable cast.	10.50 to 11.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	15.00 to 15.50
Shafting	15.00 to 15.50
No. 1 RR. wrought.	11.00 to 11.50
No. 1 wrought long.	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace.	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50

Per gross ton, delivered local foundries:  
No. 1 machn. cast...\$13.50 to \$14.00  
No. 2 cast...10.50 to 11.00

\* \$1.50 less for truck loads.

† Northern N. J. prices are \$2 to \$2.50 higher.

## BOSTON

Dealers' buying prices per gross ton:

Breakable cast	\$9.40
Machine shop turn.	3.38
Mixed bor. & turn.	2.25
Bun. skeleton long.	7.65
Shafting	15.25 to 15.50
Cast bor. chemical.	5.00 to 6.00

Per gross ton delivered consumers' yards:

Textile cast	\$13.50 to \$14.00
No. 1 machine cast.	13.00 to 14.00

Per gross ton delivered dealers' yards:

No. 1 hvy. mltng. steel.	\$11.75 to \$12.00
No. 2 steel	10.50 to 10.75

## PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$13.00 to \$13.50
No. 2 hvy. mltng. steel.	12.50 to 13.00

## CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mltng. steel.	\$9.25 \$8.75
No. 2 hvy. mltng. steel.	8.00 7.50
Mixed dealers steel.	6.75 6.25
Drop forge flashings.	8.25 7.75
New loose clippings.	4.25 3.75
Busheling	3.75 3.25
Scrap pipe	4.25 3.75
Steel turnings	4.25 3.75
Cast borings	3.75 3.25
Machinery cast	14.00 13.50
Dealers cast	12.00 11.50
Stove plate	8.00 7.50

## EXPORT

Dealers' buying prices per gross ton:  
New York, truck lots, delivered, barges

No. 1 hvy. mltng. steel.	\$12.00 to \$12.50
No. 2 hvy. mltng. steel.	10.50 to 11.00
No. 2 cast	10.50 to 11.00
Stove plate	9.50 to 10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$13.75 to \$14.00
No. 2 hvy. mltng. steel.	12.75 to 13.00
Rails (scrap)	14.00 to 14.25

Philadelphia, delivered alongside boats, Port Richmond.

No. 1 hvy. mltng. steel.	\$15.00 to \$15.25
No. 2 hvy. mltng. steel.	13.50 to 13.75



## PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

Steel prices on these pages are base prices only and f.o.b. mill unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases the amount of freight which must be absorbed in order to meet competition.

### SEMI-FINISHED STEEL

#### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton  
Rerolling .....\$34.00  
Forging quality ..... 40.00

#### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton  
Open hearth or bessemer .....\$34.00

#### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.  
Grooved, universal and sheared .....1.90c.

#### Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton  
Pittsburgh, Chicago or Cleveland .....\$43.00  
Worcester, Mass. .... 45.00  
Birmingham ..... 43.00  
San Francisco ..... 52.00  
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

### SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham ..... 2.15c.  
Detroit, delivered ..... 2.25c.  
Duluth ..... 2.25c.  
Philadelphia, delivered ..... 2.47c.  
New York ..... 2.49c.  
On cars dock Gulf ports ..... 2.50c.  
On cars dock Pacific ports ..... 2.75c.

### RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham ..... 2.00c.  
On cars dock Tex. Gulf ports... 2.45c.  
On cars dock Pacific ports... 2.70c.

### BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. .... 1.80c. to 2.05c.  
Detroit, delivered ..... 1.90c. to 2.15c.  
On cars dock Tex. Gulf ports ..... 2.15c. to 2.40c.  
On cars dock Pacific ports... 2.50c.

### RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham .... 1.70c. to 1.90c.  
Detroit, delivered ..... 1.80c. to 2.00c.  
On cars dock Tex. Gulf ports ..... 2.05c. to 2.25c.  
On cars dock Pacific ports... 2.35c.

### IRON BARS

Chicago and Terra Haute..... 2.15c.  
Pittsburgh (refined) ..... 3.60c.

### COLD FINISHED BARS AND SHAFTING\*

Pittsburgh, Buffalo, Cleveland, Chicago, and Gary ..... 2.65c.  
Detroit ..... 2.70c.

\* In quantities of 10,000 to 19,999 lb.

### PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.\*  
Philadelphia, del'd ..... 2.05c. to 2.15c.  
New York, del'd ..... 2.19c. to 2.29c.  
On cars dock Gulf ports ..... 2.45c.  
On cars dock Pacific ports ..... 2.60c.  
Wrought iron plates, P'tg. .... 3.80c.

\* Subject to concessions, particularly in the East, of \$2 a ton.

### FLOOR PLATES

Pittsburgh or Chicago ..... 3.35c.  
New York, del'd ..... 3.71c.  
On cars dock Gulf ports ..... 3.70c.  
On cars dock Pacific ports ..... 3.95c.

### STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham ..... 2.10c.  
Philadelphia, del'd ..... 2.21c.  
New York, del'd ..... 2.27c.  
On cars dock Gulf ports ..... 2.45c.  
On cars dock Pacific ports... 2.70c.

### STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.  
On cars dock Gulf ports ..... 2.85c.  
On cars dock Pacific ports... 2.90c.

### RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton .....\$40.00  
Angle bars, per 100 lb. .... 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton .....\$40.00  
Light rails (from rail steel) per gross ton ..... 39.00

Base per Lb.

Cut spikes ..... 3.00c.  
Screw spikes ..... 4.55c.  
Tie plates, steel ..... 2.15c.  
Tie plates, Pacific Coast ports. 2.25c.  
Track bolts, to steam railroads 4.15c.  
Track bolts to jobbers, all sizes (per 100 counts) ..... 65-5  
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

### SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago ..... 2.00c.  
Detroit, delivered ..... 2.10c.  
Philadelphia, delivered ..... 2.17c.  
Granite City ..... 2.10c.  
On cars dock Pacific ports... 2.50c.  
Wrought iron, Pittsburgh ..... 4.10c.

Cold Rolled\*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago ..... 3.05c.  
Detroit, delivered ..... 3.15c.  
Granite City ..... 3.15c.  
Philadelphia, delivered ..... 3.37c.  
On cars dock Pacific ports... 3.65c.

\* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.  
From May 10 up to and including May 15, reductions from the base price of hot and cold rolled sheets running from \$4 to \$8 a ton were prevalent. Concessions withdrawn, on May 15.

Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

### Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham ..... 3.50c.  
Philadelphia, del'd ..... 3.67c.  
Granite City ..... 3.60c.  
On cars dock Pacific ports... 4.00c.  
Wrought iron, Pittsburgh ..... 6.10c.

### Electrical Sheets (F.o.b. Pittsburgh)

Base per Lb.

Field grade ..... 3.20c.  
Armature ..... 3.55c.  
Electrical ..... 4.05c.  
Motor ..... 4.95c.  
Dynamo ..... 5.65c.  
Transformer 72 ..... 6.15c.  
Transformer 65 ..... 7.15c.  
Transformer 58 ..... 7.35c.  
Transformer 52 ..... 8.45c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

### Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary... 3.80c.  
F.o.b. cars dock Pacific ports. 4.50c.

### Vitreous Enameling Stock, 20 Gage\*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland ..... 3.35c.  
Detroit, del'd ..... 3.45c.  
Granite City ..... 3.45c.  
On cars dock Pacific ports... 3.95c.

### TIN MILL PRODUCTS

\*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary .....\$5.00  
Standard cokes, Granite City.. 5.10

\* Prices effective Nov. 10 on shipments through first quarter of 1939.

### Special Coated Manufacturing Ternes

Per Base Box

Granite City .....\$4.10  
Pittsburgh or Gary ..... 4.30

### Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)  
8-lb. coating I.C. ....\$12.00  
15-lb. coating I.C. .... 14.00  
20-lb. coating I.C. .... 15.00  
25-lb. coating I.C. .... 16.00  
30-lb. coating I.C. .... 17.25  
40-lb. coating I.C. .... 19.50

### Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary 3.05c.  
Granite City ..... 3.15c.  
On cars dock Pacific ports, boxed ..... 4.00c.

### HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.00c.  
Detroit, delivered ..... 2.10c.

### Cooperage Stock

Pittsburgh & Chicago ..... 2.10c.

From May 10 up to and including May 15, reductions in the base price of hot rolled strip running from \$4 to \$8 a ton were prevalent. Concessions withdrawn on May 15.

Subsequent to May 15, many orders originally placed at \$4 to \$6 below the base price were adjusted to the full \$8 concession.

### COLD ROLLED STRIP\*

Base per Lb.

Pittsburgh, Youngstown or Cleveland ..... 2.80c.  
Chicago ..... 2.90c.  
Detroit, delivered ..... 2.90c.  
Worcester ..... 3.00c.

\* Carbon 0.25 and less.

### Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland ..... 2.95c.  
Detroit, delivered ..... 3.05c.  
Worcester ..... 3.35c.

From May 10 up to and including May 15, reductions from the base price of cold rolled strip amounting to \$4 a ton were prevalent. Concessions withdrawn on May 15.

### COLD ROLLED SPRING STEEL

Pittsburgh and

Cleveland Worcester

Carbon 0.26-0.50% 2.80c. 3.00c.  
Carbon 0.51-0.75 4.30c. 4.50c.  
Carbon 0.76-1.00 6.15c. 6.35c.  
Carbon 1.01-1.25 8.35c. 8.55c.



## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

### To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

\* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

### To the Trade

	Base per Key
Standard wire nails	\$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barless wire	3.30
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool	\$2.62
Stand. 2 pt., 12.5 gage barbed hog wire, per 80 rod spool	\$2.80

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld	
Steel	Wrought Iron
In. Black Galv.	In. Black Galv.
1/8 .....56 36	1/8 & 1/4 .....+9 +30
1/4 to 3/8 .....59 43 1/2	1/2 .....24 6 1/2
1/2 .....63 1/2 54	3/4 .....30 13
3/4 .....66 1/2 58	1 & 1 1/4 .....34 19
1 to 3 .....68 1/2 60 1/2	1 1/2 .....38 21 1/2
	2 .....37 1/2 21

Lap Weld	
In. Black Galv.	In. Black Galv.
2 .....61 52 1/2	2 .....30 1/2 15
2 1/2 & 3 .....64 55 1/2	2 1/2 to 3 1/2 .....31 1/2 17 1/2
3 1/2 to 6 .....66 57 1/2	4 .....33 1/2 21
7 & 8 .....65 56 1/2	4 1/2 to 8 .....32 1/2 20
9 & 10 .....64 1/2 55	9 to 12 .....28 1/2 15
11 & 12 .....63 1/2 54	

Butt weld, extra strong, plain ends	
In. Black Galv.	In. Black Galv.
1/8 .....54 1/2 41 1/2	1/8 & 1/4 .....+10 +43
1/4 to 3/8 .....56 1/2 45 1/2	1/2 .....25 9
1/2 .....61 1/2 57 1/2	3/4 .....31 15
3/4 .....65 1/2 57 1/2	1 to 2 .....38 22 1/2
1 to 3 .....67 60	

Lap weld, extra strong, plain ends	
In. Black Galv.	In. Black Galv.
2 .....59 51 1/2	2 .....33 1/2 18 1/2
2 1/2 & 3 .....63 55 1/2	2 1/2 to 3 1/2 .....34 1/2 25 1/2
3 1/2 to 6 .....66 1/2 59	4 to 6 .....37 1/2 24
7 & 8 .....65 1/2 56	7 & 8 .....38 1/2 24 1/2
9 & 10 .....64 1/2 55	9 to 12 .....32 20 1/2
11 & 12 .....63 1/2 54	

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

### Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless	Lap Weld
	Cold Drawn	Hot Rolled
1 in. o.d. ....13 B.W.G.	\$ 9.01	\$ 7.82
1 1/4 in. o.d. ....13 B.W.G.	10.67	9.26
1 1/2 in. o.d. ....13 B.W.G.	11.70	10.23
1 3/4 in. o.d. ....13 B.W.G.	13.42	11.64
1 in. o.d. ....13 B.W.G.	15.03	13.04
2 1/4 in. o.d. ....13 B.W.G.	16.76	14.54
2 1/2 in. o.d. ....12 B.W.G.	18.45	16.01
2 3/4 in. o.d. ....12 B.W.G.	20.21	17.54
3 in. o.d. ....12 B.W.G.	21.42	18.59
3 1/2 in. o.d. ....12 B.W.G.	22.48	19.50
3 3/4 in. o.d. ....11 B.W.G.	28.37	24.62
4 in. o.d. ....10 B.W.G.	35.20	30.54
4 1/2 in. o.d. ....10 B.W.G.	43.04	37.35
5 in. o.d. ....9 B.W.G.	54.01	46.87
6 in. o.d. ....7 B.W.G.	82.93	71.96

Extras for less carload quantities:	
	Base
10,000 lb. or ft. over	5%
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

## CAST IRON WATER PIPE

### Per Net Ton

*6-in. and larger, del'd Chicago	\$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$5 delivered Chicago and 4-in. pipe, \$45, Birmingham, and \$54 delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland Birmingham or Chicago)

### Per Cent Off List

Machine and carriage bolts:	
1/2 in. and 6 in. and smaller	68 1/2
Larger and longer up to 1 in.	66
1 1/2 in. and larger	64
Lag bolts	66
Plow bolts, Nos. 1, 2, 3, and 7	68 1/2
Hot pressed nuts, and c.p.c. and t-nuts, square or hex. blank or tapped:	
1/2 in. and smaller	67
9/16 in. to 1 in. inclusive	64
1 1/2 in. and larger	62

On the above items with the exception of plow bolts, there is an additional allowance of 10 per cent for full container quantities. On all of the above items, there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts U.S.S. S.A. 15.	
1/2 in. and smaller	67
9/16 to 1 in.	64
1 1/2 in. and larger	62

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached	72 1/2
Stove bolts in packages, with nuts separate	72 1/2 and 12 1/2
Stove bolts in bulk	84

On stove bolts freight is allowed to destination on 200 lb. and over.

### Large Rivets

(1/2 in. and larger)

### Base Per 100 Lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....\$3.40

### Small Rivets

(7/16 in. and smaller)

### Per Cent Off List

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham .....65 and 10

### Cap and Set Screws

(Freight allowed to destination)

### Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled headless set screws, cut thread 1/4 in. and smaller	70
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67 1/2
Upset set screws, cup and oval points	75
Milled studs	60

## Alloy Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, \$56.00 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.70c.
Delivered, Detroit	2.80c.
S.A.E.	Alloy
Series	Differential
Numbers	per 100 Lb.
200 (1/2 % Nickel)	\$0.35

2100 1 1/2 % Nickel	\$0.75
2300 (3 1/2 % Nickel)	1.55
2500 (5 % Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.55
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4340 Chr.-Ni.-Mo.	1.65
4345 Chro.-Ni.-Mo.	1.85
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.35
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. base per lb. Delivered Detroit, 3.45c., carlots.

## STAINLESS & HEAT RESISTANT ALLOYS

(Base prices, cents per lb. f.o.b. Pittsburgh)

Chrome-Nickel	
	No. 304
Forging billets	21.25c.
Bars	25c.
Plates	29c.
Structural shapes	25c.
Sheets	36c.
Hot-rolled strip	23.50c.
Cold-rolled strip	30c.
Drawn wire	25c.

Straight Chrome	
	No.
410	430
Bars 18.50c.	19c.
Plates 21.50c.	22c.
Sheets 26.50c.	29c.
Hot stp. 17c.	17.50c.
Cold stp. 22c.	22.50c.

## TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 3c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

## British and Continental

### BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£10 8s.
Beams, open-hearth	£10 5s.
Channels, open hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£15 15s.

## CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet Bars	Nominal
Plate 1/4 in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet 1/4 in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

## RAW MATERIALS PRICES

### PIG IRON

#### No. 2 Foundry

F.o.b. Everett, Mass.	\$22.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

\* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

#### Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

#### Basic

F.o.b. Everett, Mass.	\$21.50
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

#### Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.	23.00
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

#### Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$26.50
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#### Gray Forge

Valley or Pittsburgh furnace	\$20.50
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#### Charcoal

Lake Superior furnace	\$25.00
Delivered Chicago	28.34

#### Canadian Pig Iron

##### Per Gross Ton

Foundry iron	\$24.50 base
Malleable	25.00 base
Basic	24.50 base

##### Toronto

Foundry iron	\$22.50 base
Malleable	23.00 base
Basic	22.50 base

On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

### FERROALLOYS

#### Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

##### Per Gross Ton

Domestic, 80% (carload) .....\$30.00

#### Spiegeleisen

##### Per Gross Ton Furnace

Domestic, 19 to 21% .....\$28.00  
Domestic, 26 to 28% ..... 33.00

#### Electric Ferrosilicon

##### Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk) .....\$69.50\*  
50% (ton lots in 50 gal. bbl.)... 80.50\*  
75% (carload lots, bulk) .....126.00\*  
75% (ton lots in 50 gal. bbl.)...139.00\*

#### Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

##### Per Gross Ton

10.00 to 10.50% .....\$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.10% and under, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

#### Silvery Iron

##### Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% .....\$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

#### Ferrochrome

##### Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon .....10.50c.\*  
2% carbon .....16.50c.\*  
1% carbon .....17.50c.\*  
0.10% carbon .....19.50c.\*  
0.06% carbon .....20.00c.\*

#### Silico-Manganese

##### Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon .....\$83.00  
2.50% carbon ..... 88.00  
2% carbon ..... 93.00  
1% carbon .....103.00

#### Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads... \$1.75  
Ferrotungsten, 100 lbs. and less  
Ferrovanadium, contract, per lb. contained V., delivered .....\$2.70 to \$2.90†  
Ferrochromium, per lb. contained chromium, f.o.b. Niagara Falls, N. Y., ton lots .....\$2.25†  
Ferrocarborundum, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton .....\$142.50  
Ferrocarborundum, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton .....\$157.50  
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton .....\$58.50  
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville .....\$75.00  
Ferromolybdenum, per lb. Mo. f.o.b. furnace ..... 95c.  
Calcium molybdate, per lb. Mo. f.o.b. furnace ..... 80c.  
Molybdenum oxide briquettes 48-52% Mo; per lb. contained Mo, f.o.b. Langeloth, Pa. .... 80c.

\* Spot prices are \$5 per ton higher.  
† Spot prices are 10c. per lb. of contained element higher.

### ORES

#### Lake Superior Ores

##### Delivered Lower Lake Ports

##### Per Gross Ton

Old range, Bessemer, 51.50%...\$5.25  
Old range, non-Bessemer, 51.50% 5.10  
Messabi, Bessemer, 51.50%..... 5.10  
Messabi, non-Bessemer, 51.50% 4.95  
High phosphorus, 51.50%..... 4.85

#### Foreign Ore

##### C.i.f. Philadelphia or Baltimore

##### Per Unit

Iron, low phos., copper free, 55 to 58% dry, Alogeria ..... 12c.  
Iron, low phos., Swedish, average, 68½% iron ..... 12c.  
Iron, basic or foundry, Swedish, aver. 65% iron ..... 11c.  
Iron, basic or foundry, Russian, aver. 65% iron ..... Nominal  
Man., Caucasian, washed 52% ..... 29c.  
Man., African, Indian, 44-48% ..... 25c.  
Man., African, Indian, 49-51% ..... 28c.  
Man., Brazilian, 46 to 48% ..... 27c.

##### Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered .....\$13.00  
Tungsten, domestic, scheelite delivered .....\$15.00 to \$16.00  
Chrome or (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade) .....\$15.00  
Rhodesian, 45% ..... 19.00  
Rhodesian, 48% ..... 22.00  
Turkish, 48-49% ..... 22.50  
Turkish, 45-56% ..... 19.50  
Turkish, 40-41% ..... 17.00  
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50% .....\$24.00  
48-49% ..... 23.50

### FLUORSPAR

##### Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail .....\$17.00  
Domestic, f.o.b. Ohio River landing barges .....\$18.00 to 19.00  
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines ..... 18.00  
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid.... 21.50  
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines.... 31.50

### FUEL OIL

##### Per Gal.

No. 2, f.o.b. Bayonne .....\$3.875c.  
No. 6, f.o.b. Bayonne ..... 2.50c.  
No. 5 Bur. Stds., del'd Chicago 3.25c.  
No. 6 Bur. Stds., del'd Chicago 2.75c.  
No. 3 distillate, del'd Cleve'd. 5.50c.  
No. 4 industrial, del'd Cleve'd. 5.25c.  
No. 5 industrial, del'd Cleve'd. 3.75c.  
No. 6 industrial, del'd Cleve'd. 3.50c.

### COKE

##### Per Net Ton

Furnace, f.o.b. Connellsville, Prompt ..... \$3.75  
Furnace, f.o.b. Connellsville, Prompt .....\$4.75 to 5.50  
Foundry, by - product Chicago ovens ..... 10.25  
Foundry, by - product, del'd New England... 12.50  
Foundry, by - product, del'd Newark or Jersey City .....10.88 to 11.40  
Foundry, by - product, Philadelphia ..... 10.96  
Foundry, by - product, delivered Cleveland .. 10.30  
Foundry, by - product, delivered Cincinnati... 9.75  
Foundry, Birmingham... 7.50  
Foundry, by - product, del'd St. Louis industrial district .....10.75 to 11.00  
Foundry, from Birmingham, f.o.b. cars dock Pacific ports ..... 14.75



# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH\*

	Base per Lb.
Plates	3.40c.
Shapes	3.40c.
Soft steel bars and small shapes	3.35c.
Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.65c.
Hot rolled strip	3.60c.
Hot rolled sheets	3.35c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.60c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb. On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge. All above prices for delivery within the Pittsburgh switching district.

## NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	3.75c.
Structural shapes	3.75c.
Soft steel bars, round	3.84c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.09c.
Flats up to 12 in. wide	4.09c.
Cold-rolled strip soft and quarter hard	3.51c.
Hot-rolled strip, soft O.H.	3.96c.
*Hot-rolled sheets (8-30 ga.)	3.40c.
Galv. sheets (24 ga.)	4.50c.
Long ternes (24 ga.)	5.50c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.60c.
Deep drawing	4.85c.
Stretcher leveled	5.10c.
SAE, 2300, hot-rolled	7.35c.
SAE, 3100, hot-rolled	5.90c.
SAE, 6100, hot-rolled annealed	8.75c.
SAE, 2300, cold-rolled	8.59c.
SAE, 3100, cold-rolled, annealed	8.19c.
Floor plate, 1/4 in. and heavier	5.56c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.70c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	\$2.90

\*For lots less than 2000 lb.

## CHICAGO

	Base per Lb.
Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.50c.
Soft steel squares, hexagons, channels and Tees	3.65c.
Hot rolled strip	3.60c.
Floor plates	5.15c.
Hot rolled sheets	3.35c.
Galvanized sheets	4.25c.
Cold rolled sheets	4.30c.
Cold finished carbon bars	3.75c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

## CLEVELAND

	Base per Lb.
Plates	3.40c.
Structural shapes	3.58c.
Soft steel bars	3.25c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb., over.)	3.75c.
Hot-rolled strip	3.50c.
Cold rolled sheets	4.55c.
Cold-finished strip	2.20c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.35c.
Floor plates, 3/16 in. and heavier	5.18c.
*Black ann'd wire, per 100 lb.	\$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	5.85c.
Cold rolled alloy steel (3115)	6.75c.

\* For 5000 lb. or less.  
† 500 lb. base quantity.  
Prices shown on hot rolled bars, strip, sheets, shapes and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

## ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.47c.
Bars, soft steel (rounds and flats)	3.62c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.77c.
Cold fin. rounds, shafting, screw stock	4.02c.
Galv. sheets (24 ga.)	4.53c.
Hot rolled sheets	3.38c.
Galv. corrugated sheets, 24 ga. and heavier*	4.58c.
Structural rivets	5.02c.

\* No. 26 and lighter take special prices.

## BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	3.85c.
Plates, 1/4 in. and heavier	3.85c.
Bars	3.83c.
Heavy hot rolled sheets	3.71c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.61c.
Galvanized sheets	4.61c.
Cold rolled sheets	4.71c.

The following quantity differentials apply: Less than 100 lb., plus \$1.50 per 100 lb.; 100 to 299 lb. plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.

## BUFFALO

	Base per Lb.
Plates	3.62c.
Floor plates	5.25c.
Struc. shapes	3.40c.
Soft steel bars	3.35c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	3.65c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl., also sizes No. 8 to 30 ga.	3.35c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.32c.

## NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

## REFRACTORIES PRICES

### Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1 Ohio	39.90
Ground fire clay, per ton	7.10

### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

### Chrome Brick

	Net per Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

### Magnesite Brick

	Net per Ton
Standard f.o.b. Baltimore and Chester	\$67.00
Chemically bonded, f.o.b. Baltimore	57.00

### Grain Magnesite

	Net per Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

## PHILADELPHIA

	Base per Lb.
*Plates, 1/4-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
†Reinfor. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.06c.
*Steel hoops	4.10c.
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.40c.
†Galvanized sheets (No. 24)	4.23c.
*Diam. pat. floor plates, 1/4 in.	5.00c.

These prices are for delivery in Philadelphia trucking area.

\*For quantities between 400 and 1999 lb.

†For 10 bundles or over.

‡For one to five tons.

## BIRMINGHAM

	Base per Lb.
Bars and bar shapes	3.50c.
Structural shapes and plates	3.55c.
Hot rolled sheets No. 10 ga.	3.35c.
Galvanized sheets No. 24 ga.	4.75c. or more
Strip	3.60c.
Reinforcing bars	3.50c.
Floor plates	5.88
Cold finished bars	4.43
Machine and carriage bolts	50 & 10 off list
Rivets (structural)	\$4.60 base

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 1999 lb. All prices are f.o.b. consumer plant.

## PACIFIC COAST

	San Francisco	Los Angeles	Seattle
Plates, tanks and U. M.	3.45c.	3.80c.	3.40c.
Shapes, standard	3.45c.	3.80c.	3.50c.
Soft steel bars	3.50c.	3.80c.	3.65c.
Reinforcing bars, f.o.b. cars dock			
Pacific ports	2.275c.	open.	2.975c.
Hot-rolled sheets (No. 10)	3.45c.	4.00c.	3.70c.
Galv. sheets (No. 24 and lighter)	5.15c.	4.75c.	4.75c.
Galv. sheets (No. 22 and heavier)	5.40c.	4.75c.	4.75c.
Cold-finished steel			
Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	\$3.00	\$2.85	\$3.00

All items subject to differentials for quantity.

## ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.33c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## DETROIT

	Base per Lb.
Soft steel bars	3.33c.
Structural shapes	3.65c.
Plates	3.60c.
Floor plates	5.27c.
Hot-rolled sheets, 8 to 30 gages above 12 in. and 3/16 in., 24 in. to 48 in. wide	3.43c.
Cold-rolled sheets	4.50c.
*Galvanized sheets	4.59c.
Hot-rolled strip, under No. 12	3.63c.
Hot-rolled strip, No. 12 and over	3.43c.
Cold-finished bars	3.80c.
Cold-rolled strip	3.55c.
Hot-rolled alloy steel (SAE 3100 Series)	5.97c.
Cold-rolled alloy (SAE 2300)	8.45c.

Quantity extras apply to all items. \*Price applies only in metropolitan Detroit.



## The Week's Market News

(CONTINUED FROM PAGE 103)

Rolling Mills took 750 tons for a bridge approach. St. Louis reports award of 195 tons for a housing project in Memphis to the Jones & Laughlin Steel Corp.

A drainage works at University City, Mo., on which bids have been taken, calls for 1400 tons of bars. An Oklahoma dam project requires 875 tons.

### STRUCTURAL STEEL

*... Specifications larger in June than in May*

**T**OTAL structural specifications at PITTSBURGH during June maintained a lead over May and wound up at about 20 to 25 per cent ahead. Producers expect steady releases over the next several months and except for Independence Day interruptions, orders in the past week held up moderately well.

High spots in the week's awards include 4200 tons for a municipal center building in Washington, to American Bridge Co.; 1400 tons of curb angles for New York City, to Phoenix Bridge Co.; 1000 tons for Plumb Beach Channel bridge, Brooklyn, to Fort Pitt Bridge Works.

The U. S. Engineer office at Washington, on July 5, took bids for debris rafts for use in the Panama Canal, the specifications calling for approximately 3600 tons of plates and shapes.

### TIN PLATE

*... Holiday shutdowns reduce production this week*

**T**IN plate operations this week are roughly estimated at 50 to 55 per cent owing to holiday shutdowns. This estimate is tentative and is based on a full week's capacity. Resumption of operations to a former level of 68 to 70 per cent is expected next week. Little or no change in the volume of incoming specifications, with the exception of the fall off due to holiday influences, has been noted.

### Imports at Philadelphia

**P**HILADELPHIA—The following iron and steel imports were received here during the past week: 7000 tons of iron ore from Algeria; 2500

tons of chrome ore from South Africa; 1204 tons of pig iron from British India; 5 tons of ferrochrome, 6 tons of steel billets, 7 tons of wire rods, 149 tons of sponge iron, 47 tons of steel tubes and 12 tons of steel bars from Sweden; 15 tons of steel bars, 7 tons of steel bands and 115 tons of structural shapes from Belgium.

### ... GREAT BRITAIN ...

*... Steel demand strong abroad despite international tension*

**L**ONDON, July 3 (By Cable)—Despite international tension, steel demand is still strong and a major part of the output is now sold until the end of October. No serious delays in deliveries are envisaged, but makers are not anxious to entertain further heavy commitments. Ship steel, boiler plates, joists, and sections are being heavily specified.

Large home business in hematite pig iron has developed following the 5s. reduction, but export prices are still too high to compete successfully. There is no official announcement yet

### Capital Goods Activity Up 12% in June

**A**CTIVITY in the production and distribution of durable goods in June was at a rate equal to 67.2 per cent of the 1925-27 average, according to THE IRON AGE index, a gain of 12 per cent over May and the highest monthly average this year since March. In May, 1938, the index stood at 44.2, while in the comparable month of 1937 it was 89.9.

The chief contributors to the month's improvement were the automobile, steel and Pittsburgh series. In a month when seasonal experience has indicated a slow curtailment of operations, actual production of steel ingots advanced two percentage points in June. After adjustment for the falling trend, the steel index at the end of June stood 11.2 points above the end of May. The sharp recovery of automobile assemblies in June, following the strike in the last two weeks of May, caused the index of this component to rise 32.8 points in five weeks. The highest index position of this series in June was 73.9 as compared with a high of 67.8 in May.

The settling of the coal strike caused the Pittsburgh index, which leans heavily upon the mining and dis-

tribution of this commodity, to advance from 55.3 in the last week of May to 68.7 in the closing week of June. The movement of the heavy construction series was very erratic all month, with two advances and three declines.

Continental steel is firm with renewal demand especially from commercial users. Works are well sold and delivery delays are lengthening despite increased output. Japan has made further purchases of billets and sheet bars. There are good general exports of merchant bars, plates and shapes.

International situation is militating against new business in export tin plate but there are good regular shipments to various markets under existing contracts. Tin plate production is now averaging 75 per cent and unfilled orders are about 4,500,000 boxes. Export business is done at schedule price but general quotations are about 1s. 6d base more.

A tin plate delegation is visiting Australia in the autumn to attempt to dissuade proposed erection of Australian tin plate works. Black and galvanized sheet mill output is intensified by air raid shelter orders and other defense demands and full working is likely for many months.

### Obituary

ARTHUR SCHROEDER, president of the Schroeder Machine Co., Detroit, and district manager of the Universal Cyclops Corp., died June 28. He was 55 years old.

♦ ♦ ♦

HENRY YOUNGHAMS, associated with R. E. Olds, John D. Maxwell and other pioneer experimenters in the automotive field, was buried June 30 at Detroit. Mr. Younghams, born 75 years ago, in Erie, Pa., went to Michigan as a boy. Forty years ago he was associated with the Olds engineering plant which made marine and stationary engines. When the first Oldsmobile was built, he drove it across the city on one of the first automobile trips through Detroit. Later, in Lansing, Mich., Mr. Younghams continued with the Olds Motor Works in charge of testing and for many years afterwards was in charge of service at the Detroit branch of Olds Motor Works.

# ...NON-FERROUS...

... Export copper sales climb to 24,000 tons on Friday, then subside to normal levels ... Zinc and lead demand in satisfactory volume ... World visible tin supplies declined 4100 tons in June.

NEW YORK, July 3—Outside of an unexpected spurt in copper bookings by the foreign group on Friday, there were no new developments in the non-ferrous markets in the past week. The foreign copper sales on Friday were close to 24,000 tons, at prices which ran as high as 10.30c. per lb., c.i.f., usual European base ports. The bulk of the day's business was reported due to

the activity of one European country. On Saturday export buying dropped back to a normal basis and by this morning the foreign price was down to a range of 10.15c. and 10.20c. per lb. The domestic call for red metal continues in fair volume, but without much vigor. Producers continue to quote 10c. per lb., Connecticut Valley, for the electrolytic grade, while the open market sellers have raised their

prices from 9.975c. earlier in the week to 10c. on Friday. It is quite probable that the lower figure could still be done by large buyers.

## Zinc

A fairly active demand for spelter was reported in the past week at the unchanged price of 4.89c. per lb., New York. Most of the current buying is for forward deliveries, but several sellers reported that there was some substantial prompt filling-in in the past week. The London market continues very strong, due chiefly to the demand for supplies to take care of the large air raid shelters recently placed by the Government. This morning's price of 3c. per lb., London, on spot represents a gain of seven points over a week ago.

## Lead

A reaction to the heavy buying of the past several weeks set in in the lead market in the past week and sales, while still at a very satisfactory level, were not as heavy as in the previous week. There was some August buying, but the chief interest is still in July, which at present is about 75 per cent covered. The present volume of releases against metal on contract indicates, if the pace is maintained, that July will be another 40,000 ton month. Domestic quotations are unaltered at 4.85c. per lb., New York, while spot lead in London this morning was 3.01c. per lb., as compared with 3.04c. a week ago.

## Tin

The only interesting feature of an otherwise very dull market in the past week was the report that world visible tin supplies dropped about 4100 tons in June. This decline is credited primarily to the carryover in the East and is interpreted as indicating that the buffer pool surplus has been completely shipped and in the future the market will have to depend entirely upon new production for supplies. In view of this development, any resumption in demand for Straits tin should tend to enlarge the premium on this grade over other brands. Prices here were fairly steady most of the week on what little business was transacted, but eased over the week-end to 48.80c. per lb., for prompt Straits, New York, Monday, 0.325c. below the price of Tuesday a week ago. Cash standards in London were £229 15s. this morning, the identical price of a week ago.

## NON-FERROUS PRICES

Cents per lb. for early delivery

	June 28	June 29	June 30	July 1	July 3
Copper, Electrolytic <sup>1</sup>	10.00	10.00	10.00	10.00	10.00
Copper, Lake	10.00	10.00	10.00	10.00	10.00
Tin, Straits, New York	49.00	49.00	48.90	....	48.80
Zinc, East St. Louis <sup>2</sup>	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis <sup>3</sup>	4.70	4.70	4.70	4.70	4.70

<sup>1</sup> Delivered Conn. Valley. Deduct ¼c. for New York delivery. <sup>2</sup> Add 0.39c. for New York delivery. <sup>3</sup> Add 0.15c. for New York delivery.

## Warehouse Prices

Cents per lb., Delivered

	New York	Cleveland
Tin, Straits pig	50.00c.	52.00c.
Copper, Lake	11.25c.	11.125c.
Copper, electro	11.125c.	11.125c.
Copper, Castings	10.75c.	10.875c.
*Copper sheets, hot-rolled	18.12c.	18.12c.
*High brass sheets	16.48c.	16.48c.
*Seamless brass tubes	19.23c.	19.23c.
*Seamless copper tubes	18.62c.	18.62c.
*Brass rods	11.85c.	11.85c.
Zinc slabs	6.15c.	6.90c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.85c.	5.70c.
Lead, bar	6.45c.	8.25c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.00c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	29.50c.	29.75c.
Babbitt metal, commercial grade	21.50c.	21.75c.

\*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

## Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible..	7.875c.	9.50c.
Copper, hvy. and wire.	6.875c.	7.25c.
Copper, light and bottoms	6.00c.	6.25c.
Brass, heavy	4.125c.	4.625c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	7.50c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or comp. turnings	5.87c.	6.375c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	6.50c.	7.75c.
Sheet aluminum	12.25c.	13.75c.
Zinc	2.125c.	3.375c.

## Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin, 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 12c. a lb. QUICKSILVER, \$90-\$92 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.25c. a lb.



# FABRICATED STEEL

## NORTH ATLANTIC STATES

### AWARDS

- 4200 Tons, Washington, East building, Municipal Center, to American Bridge Co., Pittsburgh.
- 1400 Tons, New York, 100,000 ft. curb angles, to Phoenix Bridge Co., Phoenixville, Pa.
- 1000 Tons, Brooklyn, Plumb Beach Channel bridge, to Fort Pitt Bridge Works Co., Pittsburgh.
- 725 Tons, South Orange, N. J., gym and auditorium for Seton Hall College, to Bethlehem Steel Co., Bethlehem, Pa.
- 700 Tons, Waynesboro, Pa., building for Landis Tool Co., to Belmont Iron Works, Philadelphia.
- 820 Tons, New York, National Gypsum Co. rock storage building, E. 150th Street, to Ingalls Iron Works Co., Birmingham, Ala.
- 500 Tons, New York, theater, S. E. corner 43d Street & Broadway, to Lehigh Structural Steel Co., Allentown, Pa.
- 450 Tons, Tottenville, N. Y., grade crossing elimination bridges, to Bethlehem Steel Co., Bethlehem, Pa.
- 330 Tons, Wilmington, Del., Y. M. C. A. building, to Bethlehem Steel Co., Bethlehem, Pa., through Henry E. Batton, Philadelphia.
- 325 Tons, Philadelphia, factory building addition for Scholler Brothers, to an unnamed fabricator.
- 300 Tons, Rankin, Pa., approach bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 230 Tons, Sharon, Pa., alterations to building for Buhl Hospital, to an unnamed fabricator.
- 230 Tons, Oswego County, bridge, to American Bridge Co., Pittsburgh.
- 200 Tons, Elmira, N. Y., cell blocks, Elmira Reformatory, to American Bridge Co., Pittsburgh.
- 135 Tons, Pownal, Vt., State bridge, to American Bridge Co., Pittsburgh.
- 135 Tons, Warren, Me., state bridge, to American Bridge Co., Pittsburgh, Edgar Cyr, Waterville, Me., contractor.
- 225 Tons, Fredonia, N. Y., music building, New York State Normal School, to Erie Concrete & Steel Co., Erie, Pa.
- 110 Tons, New London, Conn., Montgomery Ward store, to Bethlehem Fabricators, Inc., Bethlehem, Pa.
- 110 Tons, Union, N. J., Schering Corp. building, to an unnamed bidder.

### THE SOUTH

- 2235 Tons, Rutledge, Tex., ring-follower gates for Marshall Ford Dam (mostly castings), to Hardie Tynes Mfg. Co., Birmingham, and Koppers Co., Baltimore.
- 300 Tons, State of Texas, Texas & Pacific Railway bridge requirements, to Virginia Bridge Co., Roanoke, Va.
- 230 Tons, Wilson Dam, Ala., TVA-176882, to Ingalls Iron Works Co., Birmingham.
- 140 Tons, Sheffield, Ala., TVA-176769, to Nashville Bridge Co., Nashville, Tenn.
- 165 Tons, Austin, Tex., Lower Colorado River Authority, tainter gates, to Muskogee Iron Works, Muskogee, Okla., and bridges to Mosher Steel Co., Dallas, Tex.
- 160 Tons, Cleveland, Tenn., Dixie Foundry Co., enameling plant, to International Steel & Iron Co., Evansville, Ind.

### CENTRAL STATES

- 445 Tons, Chicago, South Damen Avenue viaduct, to American Bridge Co., Pittsburgh.
- 430 Tons, Milford, Ohio, bridge HA-50-361, to Fort Pitt Bridge Works Co., Pittsburgh.
- 430 Tons, Summit County, Ohio, bridge, to Burger Iron Co., Akron, Ohio.
- 260 Tons, Humboldt, Iowa, State bridge FAP-730-C, to American Bridge Co., Pittsburgh.
- 250 Tons, Chicago Heights, Ill., factory, Wardway Paint Co., to Joseph T. Ryerson & Son, Inc., Chicago.
- 300 Tons, Youngstown, Ohio, Hillman Junior High School, to Pittsburgh Bridge & Iron Co., Pittsburgh, through Charles Shurtrump & Sons, Youngstown.
- 265 Tons, E. Alton, Ill., bridge sec. 201F, Madison County, to American Bridge Co., Pittsburgh.
- 250 Tons, Peoria, Ill., power house for Keystone Steel & Wire Co., to Mississippi Valley Structural Steel Co., St. Louis.
- 225 Tons, repairs to bridges, various locations, for Milwaukee Road, to Worden-Allen Co., Milwaukee.
- 210 Tons, Platte County, Mo., bridge FAGH-304-C, to St. Joseph Structural Steel Co., St. Joseph, Mo.

- 210 Tons, Richland County, Ohio, bridge, to Burger Iron Co., Akron, Ohio.
- 200 Tons, bridges, various locations, for Santa Fe Railroad, to Bethlehem Steel Co., Bethlehem, Pa.
- 170 Tons, Dayton, Ohio, laboratory building for Government power plant, to Burger Iron Co., Akron, Ohio.
- 160 Tons, Johnson Creek, Wis., State bridge No. 585, to Milwaukee Bridge Co., Milwaukee.
- 150 Tons, Cecil, Wis., State bridge No. 29, to Bethlehem Steel Co., Bethlehem, Pa.
- 110 Tons, Princeton, Ill., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 105 Tons, Chillothe, Ill., State bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 155 Tons, Greene County, Mo., bridge FAS-850-C, to Missouri Valley Bridge & Iron Co., St. Louis.
- 175 Tons, St. Paul, Minn., Great Northern Railway Co., bridge spans, to American Bridge Co., Pittsburgh.
- 170 Tons, Lucas County, Ohio, bridge, to R. C. Mahon Co., Detroit.

### WESTERN STATES

- 850 Tons, Grand Coulee Dam, power house framework, to American Bridge Co., Pittsburgh.
- 400 Tons, San Francisco, Federated Metals Division, American Smelting & Refining Co. plant, to Columbia Steel Co., San Francisco, through Moore Dry Dock Co., Oakland, Cal.
- 200 Tons, Salt Lake City, University of Utah shop, to International Steel & Iron Co., Evansville, Ind.
- 190 Tons, Snohomish, Wash., repairs to bridge No. 455 for Great Northern Railway Co., to American Bridge Co., Pittsburgh.

### PENDING STRUCTURAL PROJECTS

#### NORTH ATLANTIC STATES

- 1100 Tons, Bedford County, Pa., highway bridges 12-A for Pennsylvania Turnpike Commission.
- 940 Tons, New Castle County, Del., highway bridges; bids close July 19.
- 925 Tons, Bedford County, Pa., highway bridges; bids close July 7.
- 550 Tons, Brooklyn, welded steel frames for E. W. Bliss Co.
- 440 Tons, Cumberland County, Pa., highway bridges; bids received until July 7.
- 440 Tons, Montgomery and Schenectady Counties, N. Y., highway project No. F.S.S. S.S. 39-2, Strong Construction Co., Whitney, N. Y., low bidder (previously reported).
- 330 Tons, Palmerton, Pa., roasting building for New Jersey Zinc Co.
- 300 Tons, Camden, N. J., crane runway for New York Shipbuilding Co.
- 279 Tons, Orange County, N. Y., including 70 tons reinforcing steel, grade separation, project No. R.C. 4033; Wilson & English Construction Co.; New York, low bidder (previously reported).
- 150 Tons, Catskill, N. Y., State bridge RC-4038-39.
- 122 Tons, Onondaga and Madison Counties, N. Y., highway project R.C. 4019; bids close July 26.
- 113 Tons, Oneida County, N. Y., including 44 tons reinforcing steel, grade separation, project No. R.C. 4031; Dale Engineering Co., Utica, N. Y., low bidder (previously reported).
- 102 Tons, Saratoga County, N. Y., including 11 tons reinforcing steel, grade separation, project No. R.C. 4053; bids close July 26.

#### THE SOUTH

- 350 Tons, Falmouth, Ky., State bridge over South Licking River.
- 115 Tons, Laurel County, Ky., State bridge over Rockcastle River.

### CENTRAL STATES

- 900 Tons, Galt, Ill., State bridge FA, route 141, section 110-F.
- 500 Tons, Independence, Kan., State viaduct.
- 432 Tons, Cleveland, Howells School; Dehamel Construction Co., low bidder.
- 300 Tons, Chicago, warm house for fruit and produce terminal.
- 225 Tons, La Crescent, Minn., State bridge No. 5475.
- 200 Tons, Chicago, repairs, Chicago Rapid Transit Co.; bids July 6.
- 200 Tons, Youngstown division street bridge, Atlas Engineering Co., Youngstown, low bidder (previously reported).
- 165 Tons, Youngstown, South High School gymnasium.
- 140 Tons, Bismarck, N. D., State underpass.

### WESTERN STATES

- 300 Tons, San Francisco, turn tables for Southern Pacific Co.
- 243 Tons, Lewis County, Wash., Riverside bridge; bids July 11.
- Unstated tonnage, Grand Coulee Dam, traveling cranes; bids advanced to July 20.

### FABRICATED PLATES

#### AWARDS

- 845 Tons, Somerset, Pa., Allegheny Mountain Tunnel, to Commercial Shearing & Stamping Co., Youngstown.
- 450 Tons, Philadelphia, dredge for Warner Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 275 Tons, Chicago, tunnel under Chicago River, to Graver Tank & Mfg. Corp., Chicago.
- 240 Tons, Detroit, tunnel lining, Oakwood connecting sewer, to Youngstown Steel Car Corp., Youngstown.
- 175 Tons, Pittsburgh, roofs for two standpipes, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 150 Tons, Bayonne, N. J., oil storage tanks, to Bethlehem Steel Co., Bethlehem, Pa., through Graves & Quinn.
- 145 Tons, Oswego, N. Y., steam station, Central New York Power Corp., 200-ft. stack, to Chicago Bridge & Iron Co., Chicago.
- 100 Tons, Fresno, Mont., Bureau of Reclamation Spec. 1221D, outlet pipe, to Thompson Mfg. Co., Denver.

### PENDING PROJECTS

- 3600 Tons, Washington, debris rafts, Panama Canal, for U. S. Engineers.
- 100 Tons, Los Angeles, tank for Metropolitan Water District; bids July 24.

## CAST IRON PIPE

Commissioners of Public Works, Spartanburg, S. C., W. W. Griffin, chairman, asks bids until July 11 for 20-in. pipe for main water line.

Dorchester, Wis., plans pipe lines for water system; also deep-well pumping equipment and other waterworks installation. Cost about \$50,000. Financing has been arranged through Federal aid. Frank J. Davy & Son, 502 Main Street, LaCrosse, Wis., are consulting engineers.

Water Department, Wichita, Kan., will take bids soon for pipe for water system, including main trunk lines; also for storage reservoir, collecting system, pumping station and other waterworks installation for expansion and improvements in existing system. Cost close to \$2,425,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Cuba, Ala., plans pipe lines for water system and other waterworks installation. Cost close to \$25,000. J. W. Goodwin Engineering Co., Martin Building, Birmingham, is consulting engineer.

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., plans water pipe lines in districts Nos. 1577 and 1583, recently created.

Iowa Public Service Co., Sioux City, Iowa, plans water pipe lines at Castle Hill, near Waterloo, Iowa. Cost close to \$25,000. A 25-year franchise has been asked and municipality has called special election July 11 to vote approval.

Bourne Water District, Bourne, Mass., plans pipe lines for water system; also elevated steel tank and other waterworks installation. Cost about \$300,000. Whitman & Howard, 89 Broad Street, Boston, are consulting engineers.

Santa Monica, Cal., has opened bids on 270 tons of 4, 6, 8, and 12-in. pipe (class 250).

Gilbert Water District, Portland, Ore., will open bids July 10 on 7000 ft. of 4-in. and 4500 ft. of 6-in. pipe.

Anacortes, Wash., plans extensions and improvements in water system, including about 15,000 ft. of 6-in. pipe to replace present main line. Cost about \$55,000; of which about \$25,000 will be secured through Federal aid. T. G. McCrory is city engineer in charge.

Burbank, Cal., plans purchase of about 11,000 ft. of 4 to 8-in. pipe for water system.

Goldendale, Wash., plans about 15,000 ft. of 8-in., and 4000 ft. of 6 and 4-in. pipe for water system. Financing is being arranged through Federal aid.



## Makers Offer New Designs in Spot and Arc Welding Apparatus

(CONCLUDED FROM PAGE 63)

uncoated rods or using flux powders are claimed.

### Cutting Torch

FOR speed and economy in tough cutting operations, such as hole punching, cutting rusty plates in multiple and deseaming billets, the *Bastian-Blessing Co.*, Chicago, has developed a new torch called the Rego KX. It has stainless steel head and tubes, forged brass body and solid drawn copper tips. A 19 or 26 in. length torch is available, with a 75 or 90-deg. head angle, bottom and side position of high pressure valve levers and three series of tips. Rego KXX is identical in construction but is priced lower because of the substitution of a heat resisting bronze head and special alloy tubes for the stainless steel.

### Duplex Welding Hose

IN the Condor duplex welding hose, made by the *Manhattan Rubber Mfg. Division*, Passaic, N. J., the oxygen and acetylene lines are held together by a permanent web joint, thus preventing tangling, kinking and snagging while the hose is in use. The ends are separated 18 in. for the torch end and 24 in. for the tank end for ease in making connections. This hose may be obtained in either one or two braid or in heavy duty braid and spiral cord construction. Covers are corrugated and are colored red and green to distinguish the oxygen from the acetylene line.

### Anti-Spatter Compounds

SEVERAL types of anti-spatter compounds have been introduced in recent months. All are intended to reduce the amount of weld cleaning time. Spatter-Nox is a product of the *Mahoning Paint & Oil Co.* and is being distributed by the *Universal Power Corp.*, 4300 Euclid Avenue, Cleveland. It is sprayed or brushed over the areas likely to be affected by subsequent welding operations. Spatter-Nox is said to reduce spatter adhesion from 50 to 75 per cent and if coated electrodes are used, it reduces slag cleaning time also. Rust inhibitor properties prevent after rusting adjacent to weld.

SPATTER-EX compound is transparent and of light jelly consistency. It is effective in arc, flash or butt welding. Flash-Ex compound, also made by the *Wayne Chemical*

*Products Co.*, Detroit, is white and pigmented. It is intended principally to be used with resistance welding apparatus to prevent the dies and welding jaws from becoming jammed with spatter and non-ferrous metals having greater electrical conductivity than steel. Both compounds are soluble in water. After welding operations, any spatter that might still be resting on surrounding surfaces is merely brushed off.

ANOTHER pigmented compound is Glyptal 1294 Gray, a recent addition to *General Electric's* line of welding accessories. It is similar to Glyptal 1294 Clear and will prevent the adhesion of weld spatter when sprayed or brushed on the work before welding. On lap welds it will prevent corrosion at the overlap, and has been particularly developed for shipbuilders, pipe and tank fabricators. Such fabricators can order their steel coated with Glyptal Gray at the mill and can store it in exposed places until needed. It serves as an excellent base for painting, the maker states.

## CANADA

### ... Production of war materials and airplanes adds to activity

TORONTO, July 3—While new business continues in good volume in the Canadian iron and steel markets, sales for the past week were affected by the Dominion Day holiday. The closing days of the week were practically a loss insofar as sales were concerned. Plant operations are holding to high operating schedules and current backlogs assure continuation of present rates for the next two or three months. Airplane makers have been rushing to get plants in shape for high speed production and, with contracts from Canada and Great Britain, airplane makers are assured of big contracts covering the next 10 years. The automotive industry is beginning to taper off in production and soon will start getting plants in shape for 1940 car models. Machine tool sales are gaining in momentum and there have been heavy purchases recently by companies getting ready for new production of war materials. Local steel interests state that sales are holding well and in most instances

business is running well ahead of that of last year.

While pig iron production is now at its peak level for the year thus far, most of the output is basic iron for further use of producing companies and there has been no betterment in merchant iron sales. Melters continue to be interested only in spot needs.

## ... PIPE LINES ...

**Water Department.** Toledo, Ohio, asks bids until July 19 for 72-in. steel pipe line for main water supply from tunnel under Maumee River to filtration plant to be built near Collins Park. Cost close to \$500,000. This is part of new water supply system from Lake Erie. Early in August bids will be asked for new main pipe line for crosstown service, and in September for elevated steel tank and tower. Greeley & Hansen, 6 North Michigan Avenue, Chicago, are consulting engineers. George N. Schoonmaker is chief waterworks engineer for city.

**Northern Natural Gas Co.**, Aquila Court Building, Omaha, Neb., has plans for new welded steel pipe line from point near Sioux City, Iowa, to Minneapolis, Minn., over 260 miles, for natural gas transmission. Line will be built in different sections through Iowa and Minnesota, and surveys for part of line in northern part of first noted state have been authorized. Booster and control stations will be installed at points along route.

**Bureau of Reclamation.** Denver, asks bids until July 31 for pipe line and structures for Salt Lake aqueduct division, Provo River project, near Provo, Utah, including 85,000 lb. of steel pipe for drainage crossings; gunite coating of 240 ft. of steel pipe; also for 4 to 36-in. and 69-in. concrete pipe and about 75,000 lb. of miscellaneous metal work. (Specifications 860).

**Metropolitan Utilities District.** Eighteenth and Harney Streets, Omaha, Neb., Col. T. A. Leisen, secretary, plans pressure pipe lines for gas distribution in part of District 870.

**Mansfield, La.**, has concluded arrangements with Portex Oil & Gas Co., Center, Tex., for new 6-in. welded steel pipe line from recycling plant of latter company near Joquin, Tex., to city limits for natural gas transmission for local distribution. Cost about \$135,000 with booster and control stations and operating facilities. Jack Lanier, 560 Gladstone Boulevard, Shreveport, La., is interested in project and will be in charge of construction, on which work is scheduled to begin at once.

**Marysville, Wash.**, plans 12-in. steel pipe line to replace present 8-in. line from headworks to city, about nine miles, for main water supply. Cost about \$100,000. Sievers & Deucey, 3124 Paine Street, Everett, Wash., are consulting engineers.

**Construction Quartermaster.** Scott Field, near Belleville, Ill., has let contract to MacDonald Construction Co., 3829 West Pine Street, St. Louis, for pressure pipe line system for steam distribution, at \$113,117.

### Spain to Buy 22 Ships; German Yards Filled

HAMBURG — Negotiations are pending with Spain for construction of about 22 cargo ships of 3000 to 16,000 tons capacity each. It was proposed that Germany should book about 60 per cent of the business and Italy 40 per cent, but Spain demands prompt delivery, which cannot be granted owing to the large volume of ship construction already in German shipyards.

# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NORTH ATLANTIC ▶

**Stimmel Winch Co.**, 37-24 Twenty-second Street, Long Island City, manufacturer of electric hoists, winches, parts, etc., has filed plans for new one-story plant, 75 x 100 ft., at 32-36 Thirty-third Street. Cost close to \$40,000 with equipment. William Shary, 22 East Seventeenth Street, New York, is architect.

**Best Foods, Inc.**, 88 Lexington Avenue, New York, canner and packer, has let general contract to Cahill Brothers, 206 Sansome Street, San Francisco, for new three-story plant at Eighteenth and Bryant Streets, San Francisco. Cost about \$100,000 with equipment. Kaj Theill, 580 Market Street, San Francisco, is engineer. Offices of company in latter city are at 1900 Bryant Street.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 11 for two hoisting and rotating cranes and spare parts for aircraft service (Schedule 6605) for Brooklyn and Philadelphia Navy yards; two motor-driven drop-board hammers (Schedule 6587) for Brooklyn yard; until July 18, hexagon steel nuts (Schedule 6626) for Brooklyn and Mare Island yards.

**Parts Mfg. Corp.**, 199 South Portland Avenue, Brooklyn, automobile parts and equipment, has leased floor in building at 309-21 West Sixty-sixth Street, New York, about 12,000 sq. ft., for plant, removing from first noted location and increasing capacity.

**Commanding Officer**, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until July 25 for five ram-type, bar and chuck turret lathes (Circular 291).

**Probar Corp.**, 558 Freeman Street, Orange, N. J., operating an electroplating works for novelty metal goods manufacture, has purchased one-story plant on two-acre tract at Berkeley Heights, near Summit, N. J., for new plant. Present works will be removed to new location early in fall and capacity increased.

**Wright Aeronautical Corp.**, 132 Beckwith Avenue, Paterson, N. J., aircraft engines and parts, has let general contract to John W. Ferguson Co., 152 Market Street, for one-story and basement addition, 25 x 150 ft., for expansion in assembling division. Cost over \$70,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

**Commanding Officer**, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until July 10 for collets, chucks and face plate castings (Circular 981), 97,500 pieces of seamless steel tubing (Circular 976), two geared-head engine lathes, three precision bench lathes and additional tools and equipment (Circular 925), furnishing and installing exhaust system for carpenter shop building No. 13 (Circular 933), 10 pelleting presses (Circular 926), drill press, rotary electric machine, two floor or pedestal-type grinders, portable gas-cutting machine, grinder, screw-driving machine with power drive, motor-driven bending machine, motor-driven pipe-threading machine, gas engine-driven pipe-threading machine, and drilling machine with attachments (Circular 923), two toolroom precision lathes, one vertical shaper, and additional tools and equipment (Circular 924); until July 13, 145,000 small brass forgings (Circular 935), reworking 78,400 lb. of brass and bronze turnings (Circular 947); until July 14, four bench-type precision drilling machines (Circular 948), one chrome nickel-steel boiler tub and agitator (Circular 953).

**Zalleva Brothers**, 4041 Ridge Avenue, Philadelphia, manufacturer of copper kettles, tanks, pressure vessels, mixers, etc., have purchased part of former plant of Hilles & Jones Co., Wilmington, Del., comprising one and three-story buildings with power house, totaling

about 70,000 sq. ft. of floor space, and will modernize and remove to new location.

**Landis Tool Co.**, Waynesboro, Pa., machine tools and parts, plans one-story addition, 120 x 400 ft., for expansion in erecting division. Construction will be carried out by day labor. Cost about \$150,000 with equipment.

**Commanding Officer**, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until July 11 for 41,200 hard copper rotating bands (Circular 1400), reworking cartridge brass scrap into 790,000 lb. of cartridge brass cups (Circular 1392), 37,820 steel forgings (Circular 1402), 37,820 steel shell forgings, 5-in., 38-caliber, finished forged cavity (Circular 1399); until July 12, about 1400 heat-treated aluminum alloy castings (Circular 1414), two electric furnaces with box 3 x 2 x 7 ft. (Circular 1403); until July 13, high-speed, motor-driven precision crank shaper (Circular 1396).

**Board of Education**, State Consolidated School District No. 1, Camden, Del., William B. Simpson, secretary, asks bids until July 14 for mechanical equipment for vocational training shops, Caesar Rodney school, Robinson, Stanhope & Manning, Equitable Building, Wilmington, Del., are architects.

## ◀ BUFFALO DISTRICT ▶

**Fisher Body Division**, General Motors Corp., Detroit, has let general contract to Darin & Armstrong, Inc., 2041 Fenkel Avenue, for one-story addition to branch plant at 1001 East Delevan Avenue, Buffalo. Cost close to \$50,000 with equipment.

**Wollensak Optical Co.**, 872 Hudson Avenue, Rochester, N. Y., optical goods, eye glass frames, etc., has taken over adjoining building and will remodel to double present capacity. Precision lense-making machinery will be installed.

**E. I. du Pont de Nemours & Co., Inc.**, Niagara Falls, N. Y., has let general contract to Laur & Mack, 1400 College Avenue, for one-story addition for storage and distribution, 60 x 200 ft. Cost close to \$75,000 with equipment. Main offices are at Wilmington, Del.

## ◀ SOUTH ATLANTIC ▶

**Coca-Cola Bottling Co.**, Asheville, N. C., has let general contract to Merchant Construction Co., 290 Biltmore Avenue, for new mechanical-bottling plant, consisting of a main two-story and basement unit, 116 x 160 ft., and two smaller one-story structures adjoining for auxiliary service, including machine shop, automobile service and garage, and other mechanical departments. Cost close to \$200,000 with machinery. Henry I. Gaines, Public Service Building, is architect.

**United States Engineer Office**, Wilmington, N. C., asks bids until July 14 for one condenser, two air ejectors, one after-condenser, motor-driven condensate pump, circulating pump with steam turbine and reduction gears, and spare parts (Circular 159), 16 x 16-in. horizontal duplex, piston valve, throttling steam cutter engine and spare parts (Circular 160).

## ◀ NEW ENGLAND ▶

**Atwood & Morrill**, 48 Loring Avenue, Salem, Mass., steam appliances, have awarded contract to Walsh Construction Co., 119 Webb Street, Salem, for a machine shop addition. Cost about \$40,000 with equipment. Andrews, Jones, Biscoe & Whitmore, 50 Congress Street, Boston, are architects.

**Commanding Officer**, Ordnance Department, Springfield Arsenal, Springfield, Mass., asks

bids until July 10 for one high-speed drilling machine (Circular 488); until July 12, hydraulic vertical shaving machine (Circular 493), automatic milling machine (Circular 494), all motor-driven.

**Quabaug Rubber Co.**, North Brookfield, Mass., manufacturer of rubber flooring and other hard rubber products, plans rebuilding part of mill recently destroyed by fire. Loss close to \$100,000 with equipment.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until July 11 for motor-driven centrifugal oil purifiers and spare parts (Schedule 6590) for Portsmouth, N. H., and Mare Island, Cal., yards; 450 steel head shells, pieced and welded, and 450 seamless drawn steel head shells (Schedule 6624) for Newport, R. I., naval air station; until July 14, motor-driven and turbine-driven pumping units, spare parts, tools and wrenches (Schedule 6633) for Boston, Charleston and Puget Sound yards.

## ◀ WASHINGTON DIST. ▶

**Purchasing and Contracting Officer**, Holabird Quartermaster Depot, Baltimore, asks bids until July 17 for nozzles, nuts, aluminum moldings, shock absorbers, pins, pipe, water pumps, brass tubing, washers, transmissions, bumpers, clutch and brake pedals, gears, axles, gages, screws and other automobile parts (Circular 398-159).

**Chemical Warfare Service**, Edgewood Arsenal, Edgewood, Md., asks bids until July 13 for 14,000 lb. 1/4-in. solder wire (Circular 511).

**Calvert Distilling Co.**, Relay, Md., has let general contract to Consolidated Engineering Co., 20 East Franklin Street, Baltimore, for extensions and improvements in local distillery. Cost over \$50,000 with equipment.

**General Purchasing Officer**, Panama Canal, Washington, asks bids until July 10 for 5000 1-gal. tin cans and 1000 1/2-gal. cans (Schedule 3498); until July 14, 18 towing machines and control equipment (Schedule 3501).

**Crown Cork & Seal Co.**, Eastern Avenue and Kresson Street, Baltimore, metal bottle caps, capping machines, etc., plans two-story and basement addition to branch plant at 320 Carlaw Avenue, Toronto, Ont., operated in name of Crown Cork & Seal Co., Ltd. Cost close to \$60,000 with equipment. Marani, Lawson & Morris, 46 Bloor Avenue West, Toronto, are architects.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids (no closing date stated) for 25 electric overhead traveling bridge cranes for Boston, Washington, Philadelphia, Portsmouth, N. H., and Mare Island Navy yards (Specifications 9236); also bids (no closing date stated) for turbine-driven a.c. and d.c. electric generators, alternator air coolers, condensers, air ejectors, condensate pumps and auxiliary equipment for power plants at Norfolk Navy Yard; Naval Academy, Annapolis, Md.; navy yard, Portsmouth, N. H., and naval air station, Pensacola, Fla. (Specifications 9290); and bids (no closing date stated) for boiler units, oil-burning and coal-burning equipment, draft fans, heat-recovery equipment, water cooled boiler settings, air and flue gas ducts, and accessory equipment for power plants at Norfolk Navy Yard; Naval Academy, Annapolis, Md.; navy yard, Brooklyn; naval operating bases at Norfolk, Va., and Pensacola, Fla. (Specifications 9289).

## ◀ SOUTHWEST ▶

**Curtiss-Wright Corp.**, St. Louis Airplane Division, Lambert-St. Louis Flying Field, St. Louis, will transfer its small aircraft production division to plant of Curtiss Aeroplane Division of company, Buffalo, St. Louis works in future to concentrate on production of large two-engine transport aircraft units, including parts production and assembling. Small plane manufacture will be carried out at Buffalo plant, including trainer series of military planes.

**Deep Rock Oil Corp.**, Cushing, Okla., plans expansion and improvements in refinery, including new recycling and cracking unit for



gasoline production. Cost about \$75,000 with equipment. Universal Oil Products Co., 30 Rockefeller Plaza, New York, is engineer.

**City Council, McPherson, Kan.**, plans expansion and improvements in municipal electric power plant, including new turbine-generator unit and accessories, condenser, switchgear and auxiliary equipment. Cost about \$350,000. Bond issue has been authorized in that amount. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

**Superior Feed Mills, Oklahoma City, Okla.**, has approved plans for new grain elevator at mill on South Robinson Avenue. Cost over \$50,000 with elevating, conveying, screening and other equipment.

**Magnolia Petroleum Co., Magnolia Building, Dallas, Tex.**, plans expansion and improvements in oil refinery at Beaumont, Tex., with installation of new production unit for processing aviation gasoline. Cost close to \$1,000,000 with machinery. Company is a subsidiary of Socony-Vacuum Oil Co., New York.

**R. C. Can Co., 101 Chambers Street, St. Louis**, paper cans, tubes, spools, etc., has let general contract to Quisile & Andrews, Inc., 3320 West Seventh Street, Fort Worth, Tex., for new one-story branch can-manufacturing plant at Arlington, Tex. Cost close to \$50,000 with equipment.

## ◀ WESTERN PA. DIST. ▶

**American Bridge Co., Frick Building, Pittsburgh**, plans extensions and improvements in branch plant at Ambridge, Pa., including new buildings and equipment. Cost close to \$100,000.

**Peerless Coal & Iron Co., Capital City Building, Charleston, W. Va.**, will take bids soon for new coal-mining plant at Marlinton, W. Va., including mining machinery, hoisting, conveying, loading and other equipment. Cost over \$75,000.

**Aluminum Co. of America, Inc., Gulf Building, Pittsburgh**, has approved plans for one-story addition to branch plant at 2210 Harvard Avenue, Cleveland, 60 x 150 ft. Cost close to \$60,000 with equipment.

## ◀ SOUTH CENTRAL ▶

**Happy Collieries, Inc., McClelland Building, Lexington, Ky.**, C. R. Ryley, head, has approved plans for new coal-mining plant near Warren, Knox County, Ky., where company has leased about 1000 acres in Brush Creek coal field area. It will consist of several units, with hoisting, conveying, loading and other mechanical equipment. A machine shop will be built. Cost over \$85,000. Work will begin at once.

**City Council, Morgan City, La.**, plans extensions and improvements in municipal electric power plant, and waterworks station and system, including new equipment. Cost about \$110,000. Special election has been called on July 18 to approve bonds in that amount.

**Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn.**, asks bids until July 18 for radial gates for installation at Hiwassee hydroelectric power dam.

**Coca-Cola Bottling Co., Shreveport, La.**, will ask bids on general contract late this month for new one and two-story mechanical-bottling, storage and distributing plant at 275 Stoner Avenue, recently acquired. Cost close to \$250,000 with equipment. Jesse M. Shelton, Bona Allen Building, Atlanta, Ga., is architect.

## ◀ OHIO AND INDIANA ▶

**F. H. Bickford Co., 29 West Apple Street, Dayton, Ohio**, screw machine products, has let general contract to Henry Stock & Son, 26 North Ludlow Street, for one-story addition. Cost close to \$40,000 with equipment.

**Bridgeport Brass Co., Bridgeport, Conn.**, brass, copper and bronze wire, tubing, pipe, etc., has leased two-story building, 70 x 150 ft., to be erected by Nickel Plate Development Co., Terminal Tower Building, Cleve-

land, at Mayfield and East 120th Street. Cleveland, for new factory branch, storage and distributing plant. General erection contract has been let to Sam W. Emerson Co., 1836 Euclid Avenue. Cost over \$65,000 with equipment. George S. Rider Co., Terminal Tower Building, is architect.

**Constructing Quartermaster, Wright Field, Dayton, Ohio**, asks bids until July 24 for construction of dynamometer laboratories at local field for testing super-powered engines and airplanes (Circular 6681-8). This is part of a \$4,500,000 expansion and development program now under way for aircraft and airplane engine work at field.

**A. E. Staley Mfg. Co., Decatur, Ill.**, oils, starch and allied products, has let general contract to H. K. Ferguson Co., Hanna Building, Cleveland, for new soy bean oil processing, storage and distributing plant near Painesville, Ohio. Cost over \$125,000 with equipment.

**Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio**, asks bids until July 10 for thread gages, including snap, plug and pipe, etc. (Circular 1231), terminal assemblies, spark plug cable safety lock (Circular 1237).

**American Rock Wool Co., Wabash, Ind.**, manufacturer of insulation products, has let general contract to Hetherington & Berner, 701 Kentucky Avenue, Indianapolis, for three one-story additions, 60 x 60 ft., 42 x 160 ft., and 30 x 30 ft., to be used as machine shop, storage and distribution, and technical laboratory, in order noted. Cost close to \$70,000 with equipment.

## ◀ MICHIGAN DISTRICT ▶

**Stinson Aircraft Corp., Wayne, Mich.**, plans one-story addition for expansion in parts and assembling divisions. Cost over \$50,000 with equipment. Cyril E. Schley, Marquette Building, Detroit, is architect.

**Lenert-Toledo Aircraft Corp., 1220 Vance Street, Toledo, Ohio**, airplanes and parts, has leased a hangar at Pontiac, Mich., airport, for new plant for production of all-metal aircraft for military service, including parts production and assembling, for which company has secured contract from U. S. Army. William Lenert, president, will be in charge of operations at new plant.

**Chris-Craft Corp., Algonac, Mich.**, utility boats, cruisers and other vessels, has acquired waterfront property at Holland, Mich., for new boat-building plant, with storage and distributing facilities. Cost over \$70,000 with equipment.

## ◀ MIDDLE WEST ▶

**Sangamo Electric Co., Eleventh and Converse Streets, Springfield, Ill.**, electric meters, parts and other electrical equipment, has let general contract to Austin Co., Cleveland, for one-story addition, 150 x 200 ft. Cost over \$75,000 with equipment.

**Waterway Board & Paper Co., Chicago**, Emanuel M. Mendelson, head of Mendelson Brothers Paper Stock Co., 105 West Adams Street, president, recently organized by Mr. Mendelson and associates, has acquired former mill of Waterway Paper Products Co., Kedzie Avenue and East Thirty-second Street, comprising about 10-acre tract and several buildings. New owner will modernize plant for production of boxboard products and other paper specialties, to include installation of four paper-making machines and auxiliary equipment. Cost over \$2,000,000 with machinery. Daniel H. Mendelson, identified with Mendelson Brothers company, is secretary and treasurer of new company.

**Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill.**, asks bids until July 10 for spring steel wire and stainless steel wire (Circular 831).

**Town Council, Woodbine, Iowa**, asks bids until July 24 for new municipal electric power plant, including three diesel engine-generator units and auxiliary equipment. A. S. Harrington, Baum Building, Omaha, Neb., is consulting engineer.

**Bureau of Reclamation, Denver**, asks bids until July 10 for metal work for trash rack frames and sections for controlling works of Shoshone Canyon conduit, Heart Mountain division, Shoshone project, Wyo. (Specifications 1253-D); until July 11, one oil purifier, filter-paper drying oven and portable dielectric test set for Elephant Butte hydroelectric power plant, Rio Grande project, New Mexico-Texas (Specifications 1255-D).

**Fauerbach Brewing Co., Williamson Street, Madison, Wis.**, plans one-story mechanical-bottling plant at foot of South Blount Street. Cost over \$150,000 with equipment. Balch & Lippert, 16 North Carroll Street, are architects.

**Automotive Standard Co.** has leased 8000 sq. ft. of floor space at 3717 North Palmer Street, Milwaukee, for manufacture of light automobile accessories. Company recently moved to Milwaukee.

## ◀ PACIFIC COAST ▶

**Northrop Aircraft, Inc., Long Beach, Cal.**, airplanes and parts, is arranging financing for construction of new plant, fund of \$225,000 to be used for one-story units for parts production, assembling and office service, and \$252,000 for purchase of tools and equipment. An appropriation also has been allotted for experimental and development work. Company has 20-acre site near local airport.

**San Fernando Valley Milling & Supply Co., Van Nuys, Cal.**, has approved plans for erection of one-story grain mill, 86 x 200 ft., to replace plant recently destroyed by fire. Central section will be built for elevator service 60 ft. high. Cost over \$75,000 with equipment. W. Charles Sweet is company engineer in charge of erection.

**Bohemian Distributing Co., 2060 East Forty-ninth Street, Vernon, Los Angeles, Cal.**, has filed plans for one-story winery, 150 x 290 ft., with storage and distributing buildings. Cost about \$125,000 with equipment. Hugo Eckart, 1015 East Eighth Street, Los Angeles, is consulting engineer.

**Bureau of Supplies and Accounts, Navy Department, Washington**, asks bids until July 14 for three gasoline engine-driven electric welding sets for San Diego naval air station (Schedule 6612); until July 11, two electric arc furnaces and spare parts (Schedule 6561), one hand tube-bending machine (Schedule 6596), insulated electric cable (Schedule 6599) for Mare Island yard.

**Olympia Canning Co., Main Street, Olympia, Wash.**, food products, has let general contract to Phillips & Newell, Olympia, for one-story addition, 60 x 140 ft., for storage and distribution. Cost close to \$40,000 with equipment.

**Shell Oil Co., Shell Building, San Francisco**, plans expansion and improvements in oil refinery at Martinez, Cal., including additional equipment in gasoline production division and other departments; alcohol plant will be modernized and improved. Cost over \$500,000 with machinery.

**Bureau of Reclamation, Denver**, asks bids (no closing date stated) for two 2500-kva, vertical-shaft a.c. generator units, each with direct-connected main exciter and pilot exciter, voltage regulator equipment and accessories, for installation in Shasta hydroelectric power plant, Kennett division, Central Valley, Cal., project (Specifications 857).

## ◀ FOREIGN ▶

**Head, Wrightson & Co., Ltd., Teesdale Ironworks, Thornaby-on-Tees, England**, iron and steel products, has acquired about four-acre tract at Seaton Carew, for new plant for production of automobile and aircraft parts. Cost over \$200,000 with equipment.

**Champlain Brewing Co., Quebec, Que.**, plans rebuilding part of main three-story plant recently destroyed by fire. Loss close to \$150,000 with equipment.

**Lakeside Foundry Co., Ltd., Port Colborne, Ont.**, plans expansion and improvements in plant at Humberstone, Ont., including additional equipment. Cost close to \$50,000.



# THIS WEEK'S MACHINE ... TOOL ACTIVITIES ...

*... Domestic orders holding up well in most districts ...  
Summer prospects fair, although holiday and vacation periods cut machine tool production this week.*

## Cincinnati Builders Report Domestic Order Gain

CINCINNATI—The general aspect of the machine tool market in this area was unchanged during the past week, although in dollar volume domestic demand increased slightly. Lathes, which have been a trifle sluggish during the preceding period, have rebounded to approximately the former level. Other machine tools are in steady demand and the picture seems to be unchanged.

Factory operations in the area, however, will be sharply down during the current week as result of the holiday influence. Several plants are closing for the entire week to allow for the usual vacation periods. Plants in operation, however, expected to be closed down over the week-end period, with one or two plants maintaining full operation except for the Fourth and the Sunday layoff. No improvement in the shipments rate is yet reported.

## New Orders Sustain Cleveland Tool Builders

CLEVELAND—For some manufacturers in this area June proved a slightly better production month than May. Aggregate orders apparently held up well in comparison to the unusually heavy sales entered in the previous month.

Recent sales in this immediate district have been principally single machine releases. A Cleveland aircraft supplier bought a large turret lathe and expects

to place more equipment in the near future. Eight drills for a Michigan automobile manufacturer were sold during the past week; two No. 12 millers were purchased; and several single machine orders, delayed for some months, have been closed. Erie Railroad is understood to have purchased two lathes, an 18 in. x 14 ft. and a 16 in. x 8 ft. An East Liverpool concern recently bought a 5-in. horizontal boring mill and other equipment. Die and tap business for local producers is reported very satisfactory.

Many offices and factories began to shut down July 1 until July 5 or July 10, indicating that business during the first half of July would be slow.

## Sales Improvement Continues In the Middle West

CHICAGO—Last week's improvement over the first half of June is continuing, and prospects for a considerable increase in business within the next two weeks are quite good. The main source of this optimism is the International Harvester Co., whose retooling for the production of new model track-type tractors at its tractor works in Chicago has been long delayed. Machine tool sellers say that unless the equipment in which the Harvester officials are interested is purchased by the first week or two of July, they will be unable to have the machinery installed by their own deadline of Sept. 15. Some few items already have been ordered because of unusually prolonged deliveries but the bulk of the requirements is still pending. About \$700,000 will

be spent for retooling by the Nash Motors division of Nash-Kelvinator Corp. at its Kenosha and Milwaukee plants. Production on 1939 cars is about completed at both plants, with 1940 model work scheduled to begin the end of July when the new equipment is installed.

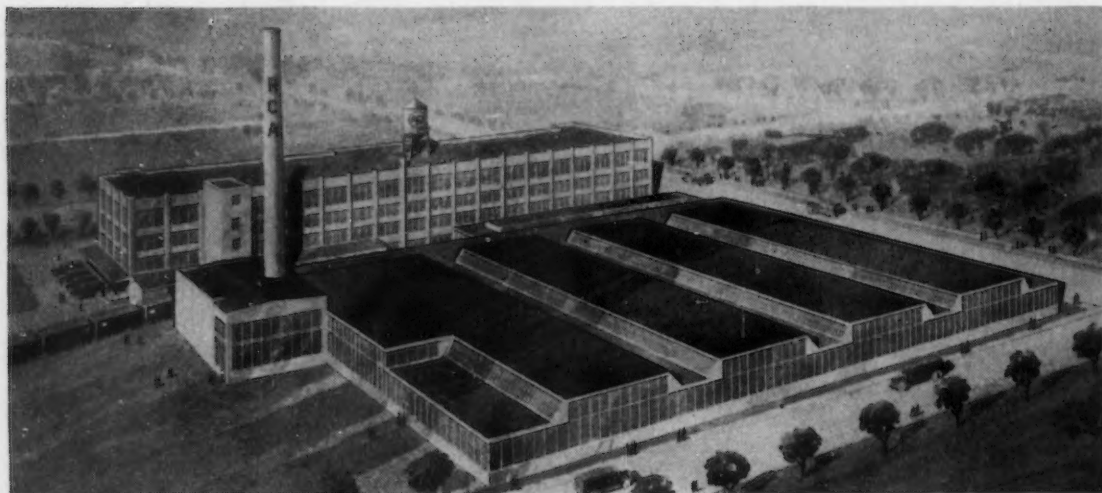
## Dollar Volume Lags In the Metropolitan Area

NEW YORK—The month of June ended on a slightly more optimistic note, as far as machine tool business in this area is concerned, but spottiness still prevails. While some sellers reported sales off for the last week, others indicated that orders were holding their former pace or were coming in once more, after being absent for a week or two. With the dominant buyers of winter and spring out of the market momentarily, the month's business was chiefly characterized by diversification. On the other hand, the dollar volume from these scattered sources, representing as they did the smaller concerns in many instances, was generally low. For one dealer, however, the month represented the second best month of the year to date in dollar volume.

## Conveyor Sales Helped By Plant Changeovers

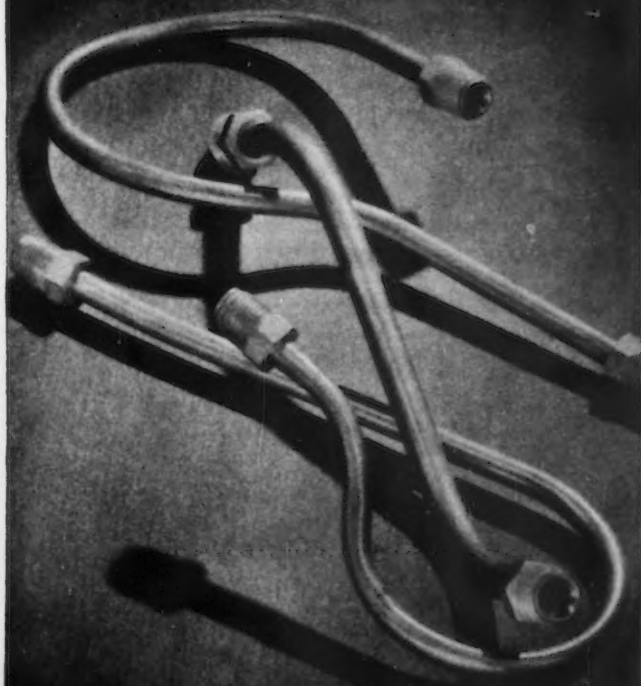
DETROIT—Plant modernization in automotive and other industries has accounted for a large volume of conveyor business, according to a Detroit source which reports that it has today the biggest volume of conveyor business and materials handling orders in years and has a big backlog of orders. Included in the active projects at present are automobile plants for both General Motors and Chrysler in California and a rubber plant in Akron, Ohio. Special equipment is being required by F. L. Jacobs Co., Detroit, which is now tooling up for production of leaf spring seats for one of the major automobile producers. Speed is being sought on this project because commitments are late. It is not expected that the tooling program will be completed before October.

## Comeback of Phonograph Results in Big, New Plant



THE phonograph has regained so much popularity that RCA Mfg. Co. is erecting this huge plant for the manufacture of Victor records to provide ample uniform, non-glare daylighting, perfect ventilation and ease of handling raw and finished materials. This one-story manufacturing plant was designed by Albert Kahn, Inc., architects and engineers, Detroit. The plant will be completed about the middle of July. It has a floor area 359 x 285 ft. and is located at Indianapolis.

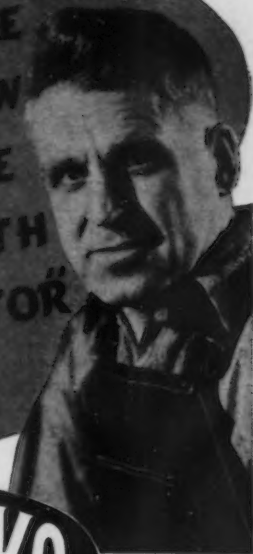
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MAINTENANCE  
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"THE THIRD FACTOR"



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**SELF-LOCKING  
HOLLOW SET SCREWS**  
with the knurled points are



Fig. 1641  
Pat. Applied For

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Fig. 1645  
Pat. App. For

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BRANCHES

CHICAGO  
ST. LOUIS  
SAN FRANCISCO



# JUST BETWEEN US TWO

## That Clip, Dassie

All that remains of our career as a linguist are the first four lines of the *Lorelei* and the remembrance that to sound an unlauted "u" you shape your lips as if to say "oo" and say "e" instead. The German language won, after a short bout, by a technical knockout.

That dismal experience soured us on foreign languages for all time, we thought, but our ambition to become a master of tongues has been fanned to a flame again by *Iscor News*, a magazine issued by the South African Iron & Steel Industrial Corp., Ltd., and published in two languages, English and Afrikaans, a form of Dutch.

Afrikaans is the perfect language, a delight to the ear and an irresistible invitation to the tongue. Take, for example, this extract from a piece entitled, "Dassie en Klipmuis:"

*Ek het nie lank gesit nie, toe kom daar skielik 'n bruin koppie te voorskyn, twee ronde ogies loer rond, en woefts daar sit Dassie op die klip. Inmekaar sit hy, sy ou gerimpelde gesig en geplooid neusie lutt 'n mens dink dat he die werld se wysheid in pag het.*

*Daar is weer 'n gesiggie, hier nog een, daar — Ag oor al kom hulle uit die skeure, en dit duur nie lank nie of die hele boel karjakker op die kranse rond. Ek sit doodstil.*

Why Dassie prefers to sit on a clip we shall probably never know. Enough for us to be told, in such limpid, mouth-filling syllables, that she does.

## Explosive Monosyllabics

A. W. Miller is making a collection of odd industrial terms (*bosh*, *sull*, etc.). Bill Sherman, our Detroit editor, contributes:

*Bod*—a cone-shaped lump of clay used to close the tap hole of a cupola

*Kish*—An excess of graphite carbon thrown out in cooling.

## Muted "E" String

"The device invented by our founder, John Williams, to save worry whether the 'e' belongs to Mr. Brown or Mr. Sharpe, by leaving it off both, is still doing yeoman duty. See page 91 of the June 22 issue," writes one of the field editors. We looked—and there it is baldly—Brown & Sharp.

## Strange Bedfellows

According to Dun-Bradstreet's, the Columbia Fastener Co., Chicago, makes snap fasteners and mucilage. Even though both are used to stick things together, the products seem incongruous.

Then there is a Brooklyn, N. Y., firm, the Consolidated Macaroni Mfg. Corp., builder of macaroni machinery and baling machinery.

But the all-time high is in an ad in an 1871 copy of your favorite family journal—Gilbert, Bennett & Co., Georgetown, Conn., manufacturer of iron wire, curled hair and glue.

## Hamburger Molder High Hats Us

One thing we never tire of boasting about is the incredible variety of products made by the one big, more or less happy family of readers of this journal, although it is kind of foolish in a way, considering that you can make anything from false teeth to farm tractors of metal.

But we will probably continue, as we think it sounds impressive. There are, however, some serious gaps in our coverage. No one in the hamburger molding machine field takes *THE IRON AGE*. We would give much if the Holly Molding Devices Co. saw the light, even though the thought of the hamburger losing the loving touch of the human hand sorrows us.

## Fair and Warmer

Those of the 18 lert readers of this column who have written in about the New York World's Fair seem most worried about the rumors of wholesale epidermis exposure in the amusement sector.

So far our visits have been devoted to the cultural aspects of the big show, but our public must be served and therefore our next trip to the meadows will be concerned wholly with a painstaking review of the Amazons, the lady with the doves and the Fair's other aesthetic features. We will report later on what it would be well to avoid.

## Puzzle

Our supply of puzzles has about given out. All we have left is this simple one, on which par is five minutes:

*In a stream flowing one mile per hour, a man rows upstream in 3 hours and back again in 2 hours. How far does he row?*

—A.H.D.

# COMPACT DEPENDABLE STURDY

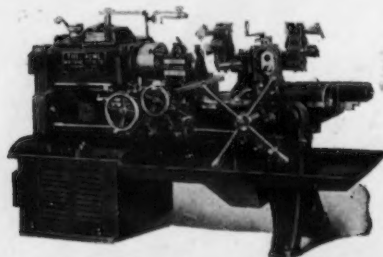
The best advertisement of Jarecki Pipe Threading Machines lies in the performance records of hundreds of users—a convincing story of reliable service, long life and definite economy. Sizes up to 12 inches in standard and heavy-duty models. Distributors in principal cities. . . . Jarecki Manufacturing Co., Erie, Pa., U. S. A.



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UP TO 26 1/2"

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